THE

VETERINARY JOURNAL

JANUARY 1904.

Editorials.

RETROSPECTIVE.

IN commencing the tenth year of our Editorship of the VETERINARY JOURNAL, we feel we cannot do better than cast a glance over the year that has just come to a close. This has been a notable one in veterinary annals. Of chief importance was the new Army Order, which secures to veterinary officers a distinct military rank, with corresponding authority, and a social recognition which was absolutely necessary to the efficient performance of their important duties. In the stress and turmoil of war, as in the dull routine of the barrack yard or the camp, it is absolutely necessary that obedience be prompt, unquestioning, unthinking ; nothing must be left to individual choice, there must be no distinction of persons. In the humbler classes there is as much attention paid to etiquette as in any court in Europe ; careful observers have pointed out that in the very humblest classes there is a minute order of precedence which no one man may neglect. In striving, therefore, for the outward symbols of authority, we contend that we have been aiming at the essential weal of the Army, and therefore of our nation. It is for the military members of our profession now to show themselves worthy of the trust that has been placed in them and the honour conferred upon them. They must show that besides being able to diagnose disease and mitigate its ravages in horses, camels, mules, and elephants, as well as to concert measures for its recurrence, they are officers of His Majesty's Army entrusted with the care of his dominions, and that they fully recognise their responsibilites as component parts of this great engine of war.

The Universities of the country are awakening to the necessity of fostering and systematising veterinary studies, and we fully expect to see a great advance in this direction in the course of the year which has just commenced. We need only refer our readers to the introductory addresses of Sir Thomas Fraser and Dr. M'Kendrick which we published and reviewed in our November number. Solidification of studies is the order of the day. Gradually, as the doctrine of evolution makes itself clearer, the world is

XUM

advancing towards recognition of the fact that it is impossible to found a science on the basis of a single group of animals or plants. Certain phenomena can be explained only by a wide comparison of data; when the comparison is wide enough it is found that what seemed an aberration or abnormality is only a survival, and this may be made the starting point for new voyages of discovery. We had recently the pleasure of sending to one of our most eminent zoologists part of a horse's foot showing three toes; in former times this would have been gazed upon with stupid wonderment and then thrown aside as a mere freak of nature of little interest except as showing that Dame Nature can be as capricious as her human counterpart; nowadays such a curiosity is hailed by the scientific man with joy. If the universities are wise, if they can throw off the shackles and fetters of tradition and custom, they will confer an immense benefit not only upon science but upon philosophy by absorbing veterinary teaching into their curriculum, by giving it the prominence which is its due, and by conferring honours and decorations on those who show eminent skill, industry, or acumen in veterinary matters. Liverpool is showing a good lead in this direction. A city which counts among its sons such men as Alfred Jones, Thompson, Yates, and Johnston is indeed fortunate, for these men show that they possess energy and capability, they give proof not only of their insight, but of their foresight, and they enjoy the essential material blessing of wealth which they are willing to use for the advance of scientific knowledge. The establishment of the School of Tropical Medicine, in connection with which the late M. Nocard made his interesting pronouncement so shortly before his death, is an epoch-making event which is fraught, we think, with great consequences to mankind. We look forward with keen interest to developments in this direction.

But not only are the directors of our great shipping companies showing their practical wisdom, by contributing splendidly to the funds and endowments of medical and veterinary schools. It is not they only who perceive, with a clearness which indicates a sound intelligence and a healthy instinct, that trade with foreign countries and our colonial possessions must be guided by sanitary laws, and by a thorough knowledge of the climatic conditions which affect men and animals native to, or resident in these countries. All over the country we find municipalities awakening to the urgent need of cleanliness in the treatment of the domestic animals. It is true that the Englishman, of the upper classes at least, is a lover of cleanliness. The Englishman and his morning tub furnish inexhaustible amusement for our continental neighbours, and their comic papers never dissociate the two, but this love of washing has not till within recent years descended to the ordinary man—certainly it has not yet descended to the poorest—still, great progress is being made, not only in the care of the human person, but also in the care of domestic animals. The stables of a noble duke or marquis were always a delight to the

eye, but now even the ordinary farmer is beginning to take a pride in his stables and byres, and this wholesome feeling is spreading everywhere. When the lady novelist wishes to express her approbation of a man in her highest terms she says that he is "well groomed." This is very significant as coming from such a source. We think that the prospects of our veterinary surgeons judged by this retrospect are distinctly good. Magistrates and councillors are everywhere erecting new slaughter houses built in accordance with the discoveries and dictates of science, dairy establishments are being watched and supervised in the most stringent manner, municipal stables, tramway and omnibus companies' stables, the stables of our great railway companies, and of the carriers who feed them—all are being remodelled, and all demand the attention of the skilled veterinarian who has a talent for organisation and possesses the imaginative faculty. For the ordinary "horse doctor" content to jog along in the fashion of fifty years ago, unprogressive, slow, impenetrable, the field is every day becoming narrower with the advance of electric traction. On the whole, however, we congratulate our professional brethren, and with a light and thankful heart, we wish them all a Good New Year.

PROFESSIONAL MISCONDUCT: AND A REMEDY.

UNDER the bye-laws of the Royal College of Veterinary Surgeons the Council have powers to deal with cases of professional misconduct, but, contrary to the bye-laws of the General Medical Council, which specify several offences, those of the Royal College of Veterinary Surgeons appear to be exclusively directed against advertising.

We maintain that we are second to none in upholding the dignity of our profession, and are of opinion that the signing of written certificates by members of the Royal College of Veterinary Surgeons for paltry fees is much more disgraceful conduct in a professional sense than legitimate advertising.

Although we would include certificates for the examination of horses for soundness, what we particularly allude to are those given to insurance companies, to the effect that animals proposed for insurance are free from disease; certificates that animals are fit for exportation or removal; also those given to the police about injured animals in the street, and to local authorities about a variety of matters.

In many cases a reasonable fee is paid, but in others an inadequate amount is given. Of course it can be said that the practitioner can refuse to attend, but we all know the temptation which even a few shillings are to a needy man, and that although every practitioner in the district may refuse to accept such low remuneration, still, if there is one that will, public authorities will go to him, as with them one veterinary surgeon's certificate is as good as another,

XUM

and if one man will work for a small amount the public think others should be content with the same.

It must be remembered that writing a certificate is a totally different professional duty from attending a case of sickness, which is relief of pain and suffering, or from verbal advice given to the best of one's power. A written certificate is a commercial document of a certain pecuniary value, the same as a bill or cheque, and the person who obtains it intends to make use of it for his own interest, and we certainly think the Council of the R.C.V.S should consider the advisability of framing a bye-law to make it disgraceful conduct in a professional sense to sign a certificate under a certain minimum fee.

The Council have full power under their charter of incorporation to pass such a bye-law, and the Courts have decided in an old medical case that they cannot determine what is "unprofessional conduct." Of the good it would do the profession in a pecuniary sense we think there can be no doubt. If people are used to getting certain services for nothing, or a small amount, they never will pay for them till forced to, and find they cannot get them for less. In the case of injured animals in the street, insurance companies and local governments, such certificates are necessary; in fact in the case of the first and last they are required by Act of Parliament.

Both branches of the legal profession give examples of prevention of *cutting* fees,—the lowest a barrister can take on a brief being a guinea, and a solicitor six and eightpence; if less were accepted the former would be in danger of being de-barred by the Benchers of his Inn, and the latter of having his certificate to practise suspended by the Incorporated Law Society.

Very little determination on the part of the profession would make the public, especially corporate bodies, pay reasonable fees, in fact in a short time they would look on it as the customary amount.

It may be urged that those members who were content to take small fees for granting certificates might get round the bye-law by giving back discount; personally, we don't think that many having got the cash would, but even if this did happen it could easily be legislated for, and the general body of the profession protected against such weak vessels. The bye-law could be very short, running perhaps somewhat as follows:—

> "That it be considered disgraceful conduct, in a professional sense, for a member of the Royal College of Veterinary Surgeons to sign a certificate in his professional capacity for a less fee than , or to enter into any arrangement to receive a less amount than ."

We would suggest that this proposed legislation might be considered by our members of Council.

Original Papers.

SOME OF THE LIMITATIONS OF VETERINARY MEDICINE.[1]

BY PROFESSOR HENRY TAYLOR.

My first obligation on this occasion is to tender you my sincere thanks for the honour you have done me in electing me your President for this year, and thereby adding my name to the list of those distinguished men who have been its President in the past: nevertheless, I shall always class myself as one of the humblest and least deserving upon that roll of illustrious men—a list which extends back for sixty-nine years, and to which, as I have said, you have done me the honour to add my name.

In electing me your President you place me under the necessity, by the time-honoured custom of all societies, of delivering an address from the chair at the opening meeting. As an occasion for giving me an opportunity of expressing my deep sense of the honour done me, the arrangement could not well be bettered, but as to the occasion for addressing you the circumstance has the commendation of all but the person in the chair. Now the subject upon which to address you has been a small source of worry to me. To fix upon a subject of equal interest to all is difficult—nay, impossible, for you are not all equally advanced along the road towards the goal of your college career, but I have chosen the above subject as one indicating some of the boundaries of our knowledge, in the hope that some day some of you may extend those limitations. As Ellen Thorneycroft Fowler in her last book remarks—"To be conscious of our limitations—that is knowledge: to realise that there are mountain tops to which we can never climb, and where the air would be too rare for us if we could—that is wisdom." I count it a very high privilege to teach, but a far higher one to help men to teach themselves. Let us glance, then, at some of our present limitations. It will be unnecessary for me to remark that it is quite evident that what our limitations are to-day is no guide to what they were twenty-five or even ten years ago, such has been the rapid progress medicine has made. We are quite conscious of the fact stated in the following lines:—

> Never yet hath any one attained
> To such perfection, but that time and place
> And use, have brought addition to his knowledge,
> Or made correction, or admonished him,
> That he was ignorant of much which he
> Had thought he knew: or led him to reject
> What he had once esteemed of highest price.

We are sometimes apt to indulge in a little supercilious smile at our forefather's tenets, but we in our turn will likely be held up to derision. The old practitioner acted up to his lights (which appear to *us* not to have been very brilliant), and we only do the same. Instead, then, for once, lauding our advanced state of knowledge, let us rather remember how little we really do know—let us be pessimistic for once. Instead of being content, strive to gain *more* information; much as we know, there is much yet that we may know, and then of course, beyond that the unknowable.

Let us first glance at our methods of diagnosis. The detection of

[1] Presidential Address delivered before the Edinburgh Veterinary Medical Society, October 1903.

latent disease in an animal by the injection of the products of the causal organism, cultivated in suitable media, has been used for some time in the two following diseases—viz., tuberculosis, glanders. In these two, the inoculation subcutaneously of tuberculin or mallein produces certain effects, such as a rise of temperature, in the diseased animal, and has no effect on the healthy one. These methods are, comparatively speaking, old ; more recent is the method of diagnosis known as sero-diagnosis—that is, the identification of a disease by the fact that the serum of the affected animal possesses certain properties not possessed (or at any rate possessed in a less degree) by that of a healthy animal.

Of late the most important discovery regarding diagnosis is the serum-agglutination test. M'Fadyean was the first to employ this method in the case of glanders, and though it will probably ever remain a laboratory process rather than a practical test for glanders, since we have mallein, yet the subject is an interesting one, and in the future we shall probably see its extension to other diseases. By agglutination we mean the clumping together of masses of bacilli in a medium on the addition of a certain serum. The serum of healthy horses agglutinates glanders bacilli slowly at dilutions below 1 in 300, whilst the serum of glandered horses is very active at dilutions below 1 in 1000, and the phenomenon is demonstrated in solutions as weak as 1 in 1600. The technique is as follows :—One adds to recent cultures (two to three days) of the glanders bacillus in peptonised bouillon, standard sterile solutions of serum diluted with boiled water or bouillon. The mixtures are made so as to give a scale of dilutions between 1 in 200 and 1 in 1000, and set aside at a temperature of 37° C. Precipitation operates at various times (six to forty-eight hours) according to the strength of the mixture and the activity of the serum. Those reactions obtained with dilutions between 1 in 450 and 1 in 850 may be taken as positive.

Other investigators have also been working on the sero-diagnosis of this disease—*e.g.*, Wladimiroff, Bourges, and Méry, Afanassieff, Jensen, Rabieux, &c.

The application of sero-diagnosis which is most known to our medical brethren is the agglutinative test for typhoid fever. Durham has made important contributions on this subject, and he has given an ingenious hypothetical explanation of mutual agglutinative reaction which is somewhat on a parallel with Ehrlich and Morgenroth's doctrine. By means of this serum test it has been found possible to separate cases of paratyphoid fever from typhoid fever, and the occurrence of paratyphoid fever as a distinct disease explains a certain proportion of the failures of the serum from supposed typhoid fever patients to clump typhoid bacilli (Welch).

This agglutination or coagulation of bacilli on the addition of serum is brought about by certain substances called antibodies. The healthy organism has an important physiological capacity for producing substances "specifically antagonistic to all sorts of foreign cells and cellular products and derivatives" (Welch).

These substances, which are either of an albuminous nature or allied to albumen, are produced in the living organism when certain substances are injected capable of inducing the necessary reaction, and their mode of antagonism consists in such divers manifestations as neutralisation of poisons and ferments, cessation of motility of cells or their appendages, destruction or injury of cells, agglutination of cells, precipitation, and

coagulation. We therefore class these products (or antagonistic bodies) by their manifestations into antitoxines, antienzymes, cytotoxines, agglutinins, precipitins, and coagulins. All these bodies are in a high degree specific to the nature and source upon which they exert their characteristic effects—at least they are usually highly specific.

Just recently these specific antibodies have been divided into two groups, in one of which, represented by the antitoxines, the antagonist is a single body; in the other, the cytotoxines or cytolysins, the antagonistic effect is due to two bodies co-operating.

The cytotoxines or cytolysins include, amongst other things, the bacteriolysins and the hæmolysins. Of the two bodies which comprise a cytotysin, the one which actually destroys the cells or produces other effects is found in the cells or fluids of the organism, but it requires the co-operation of another body distinguished from the first by greater resistance to heat, and which is produced during the process of immunisation. The elements constituting a cytolysin exist independently. Many names have been given to these cytolytic components. The one which is the specific product of immunisation is called the intermediary body, immune body, amboceptor, sensitiser fixative, preparative, and desmon, and the other one the complement, alexin, and cytose.

To follow this subject, interesting as it is, much further would lead us into the domain of Immunity, and we are only at this point concerned with the agglutination of organisms in liquids by the serum of animals which have for some time been the harbourers of that particular organism.

Arloing and Courmont have also employed the sero-diagnosis method for tuberculosis, but here again at the present time this method is only a laboratory one; nevertheless it presents the considerable advantage of detecting tubercle in animals tuberculined with a fraudulent intent, and its use may therefore be advisable as a method of control. According to Arloing's researches the serum of tubercular patients agglutinates a "homogeneous" culture of the tubercle bacilli in 1 to 10 solutions, and often 1 to 15. After five or six hours one sees clots appear in the solutions, which begin to deposit, whilst the liquid becomes transparent. The serum of healthy animals agglutinates at about 1 to 5. So far, however, investigations have not confirmed the diagnostic value of the serum reaction. Beck and Rabinowitch [1] showed that the serum of healthy subjects agglutinates often at 1 to 10, sometimes at 1 to 20 and 1 to 30; that is to say, at the same strength as the serum of tuberculous animals. Further, the serum of some of the latter is quite indifferent. Nocard and Leclainche's researches confirm these statements, and they say,[2] "the serum diagnosis does no seem practically utilisable under the conditions indicated."

At the present time diagnosis by means of serum is in a state in which we are unable to use it for practical everyday work, but it is quite within the bounds of possibility that in the future it may prove of great success.

Before leaving sero-diagnosis, I should like just to mention that we have nowadays precipitating sera, and these when further worked up will probably prove of great chemico-analytical value. Tchistowitch [3] was the first to observe this phenomenon. The chief uses to which precipitating sera

[1] Deutsche Med. Wochenschrift, 1901, No. 10.
[2] Les Maladies microbiennes des Animaux, p. 86.
[3] Tchistowitch: Immunisation contre le serum d'anguille. "Annales de l'Institut Pasteur," 1899, p. 406.

XUM

are at present designed are (*a*) the testing of albuminous urine, the serum for which is obtained from a rabbit which has previously received injections of albuminous urine. Leclainche and Vallée[1] worked this out in 1901. (*b*) The testing of human blood. Uhlenhuth[2] prepared this serum from guinea-pigs by injecting human blood into their peritoneal cavity. (*c*) The testing and differentiation of the various kinds of flesh used for the food of man—ox-flesh, horse-flesh, pig-flesh, &c. Uhlenhuth found that the serum of a rabbit which had been repeatedly inoculated with juice from the muscles of a horse possessed the power of causing a precipitate when added to a solution of horse-flesh made by triturating the flesh in water, and that this serum only possessed this power for horse-flesh. Sera for detecting other meats are similarly prepared.

Leaving sero-diagnosis, let us just glance at our ordinary methods of diagnosis. I am sorry to say many of them imperfectly fulfil all that could be wished for them. In diagnosing the seat of abdominal pain, we labour under the great disadvantage of not having available the subjective symptoms; but even in, for example, chest affections, for the diagnosis of which our text-books lay down most elaborate rules, we find theory and practice do not go together (perhaps I ought to use the first person singular for that last sentence). I have often in cases of chest affections followed the course of the particular disease, and formed a mental picture of what I should see on post-mortem examination (I always make post-mortems if at all possible), only to discover that I have been far—yes, sometimes very far—from the mark. In justice to myself, though, I ought to remark these cases are in the minority. I can remember many successful cases of undoubted pneumonia in the horse where practically nothing could be made out on auscultation and percussion. The most common pneumonia of the horse is without doubt contagious pneumonia, and perhaps those cases were of the lobular variety as distinguished from the lobar. In the lobular form the foci are numerous though small, and preclude the possibility of hearing any sounds in them by their small area and thickness of the chest wall. Another form of this pneumonia affects the lung immediately surrounding the bifurcation of the trachea. This affected area is larger than the lobular ones, but the distance from the external chest wall prevents auscultation and percussion from disclosing anything.

Notwithstanding these little drawbacks I find solace in the fact that in the sister profession heart diseases are often first diagnosed on the section table.

To come now to therapeutics. Nowadays the most enlightened way of treating a bacterial disease is by the administration of the antitoxines of the bacterium or by the serum from an immune animal, or in the case of the malarial parasites of some inimical substance like quinine, which is possessed of a specific action. But whilst quinine in the human subject is a direct specific for the malarial parasite, in our patients, affected with similar malarial organisms, quinine, though possessing perhaps some inhibitory power, is certainly not specific. In the disease known as "biliary fever" of horses in South Africa, but which is better designated "equine malaria," the parasite does not belong to the genus plasmodium or hæmamœba, the genus to which the parasite of human malaria

[1] Sur les Anti-corps Albumineux, "C. R. de la Société de Biologie," 1901, p. 51.
[2] Deutsche medicinische Wochenschrift, Feb. 7, 1901.

belongs, but to the genus pyroplasma, the parasite being closely related to the pyroplasma bigeminum and pyroplasma canis.

The pyroplasma bigeminum is the parasite which causes Texas fever in America, while the pyroplasma canis accounts for the disease known as malignant jaundice of the dog in South Africa. Another disease which is supposed to belong to this class also is redwater or hæmoglobinuria in cattle. At any rate there are in this disease the endoglobular parasites, which are very similar to those of the above-mentioned diseases.

Here, then, we have a chapter of diseases caused by similar organisms, belonging to a type closely allied to the one causing malaria to man, and whilst quinine in the human being acts specifically, in the allied diseases it has only a slight effect. The drug which, judging by the rough practical experience gained amongst equine malaria in South Africa, gave the best results was ammonium chloride.

Quinine and ammonium chloride are two very dissimilar drugs. In the other diseases, Texas fever and malignant jaundice of the dog, no particular line of treatment seems to have been practised, whilst in hæmoglobinuria of cattle the list of drugs given in this country is somewhat extensive. Chlorate of potash, turpentine, iron preparations, magnesium sulphate, &c., have all been given with more or less success.

However, the chief point of interest is that up to now we have nothing in the way of medicine upon which we can place any faith. Antitoxines cannot be got from this class of malarial parasite, so that is another line of treatment closed.

There remains the method of combating the disease by the destruction of the intermediate bearers of the pyroplasmata. For the Texas fever organism this has been found to be a tick—the bo-ophilus bovis (rhipicephalus decoloratus)—hence by destroying the ticks upon the affected animals the disease is prevented from spreading even from an animal with his blood literally teeming with parasites.

In the malignant jaundice of the dog a tick (the hæmophysalis Leachii) is also the intermediate host, but in the other diseases, equine malaria and hæmoglobinuria in cattle, the second hosts are not yet discovered. In hæmoglobinuria of cattle in this country there are one or two little points which, even supposing the second host to be a tick, require elucidation. We know that there are two forms of this disease—a parturient and a non-parturient. Now the parturient occurs often when ticks are not present on the animal, and probably have not been for some time. A natural conclusion to account for this would be that the animal harboured the parasite which, under the lowering influence of the parturient state, multiplied and broke down such an extra number of red-blood corpuscles, that the resulting liberated pigment was in solution in such quantity that the liver failed to deal with it, therefore the kidneys did so. The urine then became tinged with blood pigment. But it is queer that the lowering influence of parturition produces such an effect, whilst other ones, such as debilitating diseases, do not. Our knowledge is thus limited upon several things in this category, but I feel confident that as we are in possession of almost all the facts in connection with the etiology of Texas fever, it is only a question of time before we shall be the same with the allied diseases.

Now, in combating a disease of the Texas fever type, since neither drugs nor sera act in a beneficial manner, there are other courses which we must

XUM

pursue to try and either eliminate the affection or mitigate its ravages. The elimination or stamping-out treatment—(by the way, the expression "stamping-out" has, I see, been used in French writings to indicate the English method adopted in dealing with pleuro-pneumonia, &c., and it is rather amusing to come across it in the midst of a French sentence)—the elimination or stamping-out treatment is doubly hard when the casual organism has two hosts. To refer again to Texas fever, in Texas and the adjoining States the farmers for some years tried, and as a matter of fact are still trying, to get rid of the ticks, for once all the ticks were destroyed Texas would then be in a somewhat analagous position to Texas fever as malaria in Scotland. Now the ticks have had war waged against them by the latest improved dipping appliances, and still the disease is pretty prevalent—*i.e.*, all the ticks have not been killed. To quote from the Report of the Bureau of Annual Industry of the United States for 1900, "Many dips have been tested during the year, and were found to be unsatisfactory. The dips either do not kill the ticks or affect the cattle too severely to be of practical value. The ticks show a wonderful resistance to adverse conditions which is entirely out of proportion with their small size."

Seeing, then, that we are unable to stamp out a disease of the type of Texas fever by killing the ticks, we must try an alternative. The alternative which has found most favour in the States, and which Koch says is most likely to be successful in combating the Rhodesian cattle disease, which is another disease allied to Texas fever, is the production of a mild attack of the disease, so rendering the animal immune. Herein, however, comes the next difficulty. The inoculation of the virulent blood which gives the disease must be in such manner that it will not bring on a fatal attack, nor be too weak to protect. This is the problem which Koch is trying to work out in South Africa at present. As he says, "What remains to be done is to discover a standard of virus of such a strength that it will confer a maximum immunity with a minimum of loss from inoculation."

I have dwelt rather long on this class of diseases, but I am convinced that we are on the eve of great discoveries in reference to these diseases, and that the *rôle* played not only by ticks but by other arachnids and insects is only just beginning to be found out.

A little while ago I made reference to the therapeutical action of antitoxins and sera as being *the* object to be aimed at in the scientific treatment of to-day. What are these substances which act antagonistically towards either the bacteria themselves or their detrimental products, and where do they come from?

Pfeiffer[1] says that "The bacterial immunising subjects have their origin in the bone marrow, spleen, and lymphatic glands—*i.e.*, in the hæmatopœtic organs, and that they are neither modified bacterial substances nor combinations of bacterial products with the albuminoids of the organism, but complex molecules, making up a part of the organism and helping in the vital processes. Their appearance in the blood at the time of the immunisation ought to be considered as a specific secretion caused by a specific excitation. They comport themselves chemically and physically like ferments; they do not form part of the globulin nor albumin

[1] Report presented at the recent Brussels Congress on Hygiene on the "Mode d'action et origin des substances active des sérums préventifs et des sérums antitoxiques."

of the blood. Their nature of a ferment is demonstrated by bacteriolysis; the immunising substances incorporated with the bacterial cell find themselves free and active at the end of the dissolution of the bacterial protoplasm, after the fashion of true ferments, *e.g.*, peptic tryptic, &c. The production of these immunising substances is favoured by bleeding, and rather curiously by a strong dose of alcohol. It is hindered by chronic alcoholism and by simultaneous vaccination carried on with another species of bacterium (a circumstance to be held in regard during the preparation of polyvalent sera). The bacteriolytic action of the normal body fluids is not due to a single alexin, but to a combined action of amboceptor and complement. The phenomenon designated by the term resistance rests above all on a considerable afflux of the body fluids rich in amboceptors towards the place of infection (say the peritoneum), this afflux being caused by the inflammation."

The best example of an antitoxin is probably that for diphtheria in the human subject—at least it is the best example of a successful one. As some of you know, this antitoxin is called antidiphtheritic serum, and is prepared by injecting a horse with weakened cultures of the Klebs-Lœffler bacillus (the bacillus of diphtheria), or, better still, with suitable doses of the diphtheria toxine. The result is a febrile reaction, which soon passes away, leaving the animal less susceptible to the poison or living bacilli. By repeating and gradually increasing the dose a high degree of immunity can be produced. This form of immunity, denominated antitoxic, is associated with the development within the body of certain substances which tend to neutralise the effects of the poison. These substances are situated in the serum of the horse, which is drawn off and preserved. This is then called diptheria antitoxine. The serum of the immune animal has the power, if introduced into another animal, of protecting it from infection by the bacilli, but in addition, in the case of diphtheria, it "has an important healing influence upon diphtheria spontaneously acquired in man" (Osler, *Principles and Practice of Medicine*).

The only antitoxic serum of the above type (they are all manufactured after the same fashion) with which I am acquainted for our patients is the antitetanic serum, but we possess the following bacteriolytic sera, antistreptococcic, antirinderpest, foot-and-mouth disease, swine fever, and swine erysipelas. Now whilst the antidiphtheritic serum has an important healing influence, the antitetanic one has, in my experience, absolutely none; but inasmuch as the damage is already done to the nerve-cell by the toxine when symptoms become developed, we could hardly expect it to have any. The antistreptococcic serum has been used in France against purpura hæmorrhagica, and, I believe, strangles, with, it is said, success. Rinderpest serum confers immunity, and foot-and-mouth serum also confers a temporary immunity; it has lately been used in France for tiding over the risk of infection at agricultural shows.

However, the point I wish to arrive at in connection with these antitoxic sera is this, they have not come up to expectations which were formed of them of being curative agents, hence we as veterinarians, in combating diseases which we know we cannot cure, prefer to render the animals immune to them by the various methods employed in the different diseases. I am in hopes, however, that these antitoxic sera will sometime be made curative.

When the soluble toxines from the cultures of the tetanus bacillus were

XUM

discovered, high hopes were raised that at last we were on the high road of discovery into the mysteries of the mode of action of pathogenic bacteria; but these hopes were doomed to disappointment, for although close researches have been made into, and endeavours made to isolate, the toxines of the tubercle bacillus, the pyogenic cocci, the pneumo-coccus, and the typhoid bacillus and others, nothing has as yet been demonstrated. This is unfortunate, because once we get a toxine we believe we can get an antitoxine. Nevertheless the belief has not been abandoned that most bacteria harm by their poisons, and we must hope on.

Nocard, just previous to his death, had been experimenting with foot-and-mouth disease, with the object if possible of finding a cure for it, or at any rate a vaccine (for vaccine is the ideal of prophylaxis); but the microbe of foot-and-mouth disease has up till now baffled all research. It is in all conscience virulent enough, for the serosity diluted to 1 in 10,000 is capable of conveying the disease, but the organism has neither been seen nor cultivated outside the animal body. He is not alone in having failed in the above, for Loeffler, one of the first bacteriologists of Germany, has been working at the same subject for seven years, and has been unable to find any solution of it. The first thing in solving any bacterial disease is to isolate the organism and then to cultivate it, of course making sure that it is the right one by complying with Koch's postulates. Once that is done, we have some chance of getting an attenuated variety which, when inoculated into an animal, gives a mild type of the disease in question, thereby rendering the animal immune to further attack. This is called vaccination, and is, as I have said, the ideal method of preventing any disease, and prevention is better than cure. Still, however, we cannot hope to attain an attenuated variety of an organism without getting hold of the organism first.

Nocard, though unsuccessful in the case of foot-and-mouth disease, in preparing a vaccine, having plenty of virulent material to work with, prepared an effective serum by inoculating with it at intervals animals which had already recovered from a severe attack of the disease. The serum of animals which have had one attack of the disease has a definite immunising action, but this immunising effect is reinforced if the animal has been inoculated at different times with virulent material. The serum has not a very strong immunising effect if abstracted from animals which have only passed through one attack, whilst in the reinforced animals it is twenty to forty times stronger. The length of time animals inoculated with the strong serum remain immune is only of short duration—about fifteen days. After fifteen days most of the animals injected are liable to contract the disease afresh.

As previously remarked, the organism of foot-and-mouth disease has so far defied detection, and under the class of "invisible organisms" we must at this date also place the causal germs in the following diseases—rinderpest, rabies, South African horse sickness, and variola. The organism of pleuro-pneumonia was isolated in 1898 by Nocard and Roux. It was undoubtedly an organism of a special type, and is extremely small, so that in dilute albuminous liquids it passes through both a Berkefeld and Chamberland filter. A curious fact is that virulent albuminous liquids, undiluted pulmonary serum or bouillon Martin plus serum (on which it is generally cultivated) gives a sterile filtrate. It is difficult to cultivate outside the body.

The organism of South African horse sickness, according to Nocard, also passes through a Berkefeld, but is arrested by a Chamberland filter; but M'Fadyean's researches do not agree with those conclusions—he proved conclusively that the virus was *not* arrested by passing through a Chamberland.

In conclusion, I would just like to mention the simplification which has taken place amongst the countless diseases of the lower animals during the last decade. I mean the placing of several diseases under one category, because they have been found to be due to similar or even identical organisms. It is to Lignières[1] that we are particularly indebted in this line, for his researches in connection with the hæmorrhagic septicæmias, and more particularly those caused by organisms of the pasteurella group. Who would have thought, for example, that two such dissimilar diseases as distemper and epizootic gastritis in dogs could be caused by the same organism (one of the pasteurella group), and that the former attacks chiefly young, and the latter chiefly old dogs? Or who would have suspected that one organism was responsible for such different diseases (clinically considered) as pink eye, equine contagious pleuro-pneumonia, and epizootic catarrh? I think that mixed infection may have something to do with the diverse clinical appearances. Yet the fact of one organism being isolatable from all three diseases is very significant. Well, I myself have noticed in two outbreaks, the interchangeability of pink eye and contagious pneumonia.

Just one more example of this rearrangement of diseases. We have Nocard and Leclainche's[2] authority for saying that contagious acne of the horse, ulcerative lymphangitis of the horse, and caseous lymphadenitis of sheep (known in Scotland by the name of cruelles), are all due to the bacillus of caseous suppuration. Moreover, in the past we have paid too little attention to the possibility of mixed infections. We now know, for example, that the organism which was said to cause equine contagious pleuro-pneumonia—viz., the diplococcus of Schutz (which, by the way, is now proved to be identical with the streptococcus of strangles), intervenes only secondarily in the lung, probably after the ground has been prepared for it by another organism. This is only an illustration of what we may yet find to be the case in many other of the diseases affecting the lower animals.

It is time, however, that I brought this long and disconnected address to a close, and in thanking you for the patient attention with which you have listened to it, I think we may congratulate ourselves on the amount of knowledge we do possess regarding the ailments of the lower animals, but at the same time not lose sight of the unknown; and that each one of us should do his little towards lessening that quantity till "all diseases quenched by science" shall be the order of the day. You and I will probably not see that ideal.

> "Yet I doubt not through the ages one increasing purpose runs,
> And the thoughts of men are widened with the process of the suns."

[1] Contribution à l'étude des Septicémies Hémorragiques, Buenos-Aires, 1900.
[2] Les Maladies microbiennes des Animaux.

SWINE FEVER.

BY MR. T. B. BINDLOSS, M.R.C.V.S., LONG SUTTON.[1]

I NOTICE that the objects of this Association are to cultivate and promote veterinary medicine and surgery, the advancement of the interests of the profession, and the protection of their pecuniary and professional interests. There are different ways of aiming at these several objects, and, thinking that it is not always the most scientific papers that do most to promote the interests of the profession, and being pressed at our last meeting by our President, I consented to introduce a subject for discussion.

You will remember that at Peterborough a resolution was proposed, discussed, and passed, and sent to the Board of Agriculture and also to the different Veterinary Medical Associations, disagreeing with the present methods adopted in the attempt to stamp out swine fever, and it must be pleasing to all members of this Association to know that we voiced what has proved to be the general opinion of the profession. This had something to do with my bringing before you this paper to-day, and, though I do not attempt to bring before you anything new or very scientific, I hope that it will bring forth such a discussion that we shall all here agree as to what should be diagnosed as swine fever and what should not, and that, as far as we are concerned, there will be no contradictory diagnosis made in respect to this disease. If this object is attained then, in a small way, we must agree that something has been done in the advancement of the interest of the profession.

Swine fever is a disease presenting itself in many different ways and having a variety of symptoms. It is a disease that has been recognised as a specific contagious disease for nearly forty years. In 1875 Professor Axe described it as being the exact counterpart of typhoid fever in man. In 1865 Dr. Budd, of Clifton, read a paper on swine fever under the name of pig typhoid.

It has been described under many different titles, among the commonest of which are—pig typhoid, hog cholera, red soldier, swine plague or schweine süche, infectious pneumo-enteritis, purples, &c. This last named synonym—purples—I think should be discontinued, as the disease commonly called purples in our district is not swine fever, and has no relationship to it—it is swine erysipelas.

Swine fever is caused by a bacillus known as the bacillus of swine fever. It is a short rod-shaped organism, with rounded ends from 1·2 mm. long, and 0·6 mm. broad, and thus is only about half the size of the tubercle or the swine erysipelas bacilli. It is non-sporulating, ærobic, and does not form filaments. It stains readily by the aqueous solutions of the ordinary basic aniline dyes, but not by Gram's method of staining.

The pig is the only animal naturally affected, and it is more commonly found among store pigs than among suckers or fat pigs. I consider that this is due not so much to a peculiarity of the working of the organism, as to the fact that store pigs are taken from place to place by the dealers, and are thus much more liable to come in contact with infected material. The common method of infection is by way of the mouth, the bacillus being introduced by ingestion, and certainly the common seat of lesions is the alimentary canal.

[1] Read at the Autumn meeting of the Lincolnshire Veterinary Medical Association on the 15th November 1903.

Symptoms.—These vary very considerably, and it is impossible to set down a table of symptoms that we can say are diagnostic of swine fever, for very often only one or two symptoms show themselves. I have had cases that on post-mortem examination have shown extensive lesions, and yet, when alive, merely went off their feed for a few days. At the same time it is the rule that pigs that are suffering from swine fever have a very unthrifty appearance. As with all diseases of swine, the commonest symptom is the comparative loss of appetite, though in this disease there is not so much loss of appetite as capricious appetite. The animal will frequently approach the trough and eat but a very small quantity, and then lie down again, and there is a general preference shown for sloppy foods or fluids. There is inclination to hide in the bedding, which is nothing more than a symptom of fever and a natural instinct on the part of the pig to keep its general surface warm. The temperature in swine fever does not reach that height that it does in some other pig diseases, but it will generally range from 104° to 106° in pigs that have been recently infected and the disease in the more active stage. This one might expect to find, considering that the disease takes the form of a chronic rather than an acute type of disease. The animal appears very dull and listless, and often there is discolouration of the skin around the base of the ears and on the ears, inside the forearms and thighs and along the belly. This discolouration is not in a confluent mass, but takes the form of hæmorrhagic spots. There is frequently observed a cough, but this is not a very reliable symptom, as very many healthly pigs cough, and many that are suffering from swine fever do not cough. The bowels are generally constipated at first; later they are relaxed, due no doubt to the irritation of the mucous membrane. There is also a degree of lameness, or apparent weakness in the loins which causes a staggering gait, the animal walking comparatively firmly on the fore legs with the hind limbs reeling as if partially paralysed. I consider this one of the most diagnostic symptoms, and when observed with some of the other symptoms I have mentioned I have no hesitation in pronouncing the case one of swine fever.

The conclusive diagnosis must be made from a post-mortem examination, and the finding of either the so-called swine fever ulcer or the diphtheritic inflammation of the alimentary canal. I propose here to consider those conditions that will lead us to diagnose the disease during life.

One naturally makes inquiries as to the history of the pigs, and when we find that they have been recently purchased or exposed for sale in an open market it makes us suspicious. But we may hear that they have been on the same premises for some months—from two to six months—but have been what are described as "bad doers." This is an almost constant accompaniment of swine fever. We may also find that all the pigs on the premises were bred there, but on further inquiry elicit the fact that some of them had visited other premises for stud purposes. I once had four cases like this in quick succession, and infection was traced to the boar.

There is no doubt that boars and sows will carry the disease for a considerable period without developing any apparent symptom, but still be the means of infecting many other pigs.

As regards the discolouration of the skin, in swine fever this is of a crimson colour, and found, as I have mentioned, about the ears and those parts where the skin is thin and comparatively free from hair. Though of a similar colour to that seen in cases of brine poisoning, it should not be

mistaken for that ailment, for in brine poisoning the discolouration is much more general, and not confined to the parts I have mentioned. Discolouration of the skin occurs also by the effects of the sun's rays, or "scorching." In these cases the discolouration is fairly general over the ears and back of the head, whereas in cases of swine fever it is deepest at the base of the ears, and gradually spreads from there to the tips. The discolouration seen in cases of swine erysipelas or purples is, as the name implies, of a much darker and bluer tint, and is seen more evenly distributed over the surface of the body, though it may be patchy, but then the patches of discolouration appear to be somewhat raised above the level of the parts not so affected.

In styes where cases of swine fever exist there is generally to be observed a sour smell which is somewhat diagnostic. It is comparatively easy to recognise but difficult to describe. It resembles the odour of stale and very sour brewer's grains. It is my experience that swine fever seldom attacks with the same virulence all the pigs exposed to the same infection, for it is seldom one visits a herd of swine and finds many dead unless they are very young pigs. All *may* be suffering from the disease, but in the case of say twenty, all apparently exposed to the same infection, there may be two or three dead and two or three more showing symptoms of the disease, and if the remainder were put in quarantine for an indefinite period, as were the methods of the Board of Agriculture some two years ago, it was then found that many would linger on for many weeks while some would apparently not become affected at all.

In cases of swine fever the bowels invariably become relaxed, but in cases of swine erysipelas they are generally constipated.

In swine erysipelas and in porcine pneumonia the temperature runs to 107° to 108° (about), which is higher than in swine fever. Also in these diseases it falls as the cause is removed, whereas in swine fever as the disease becomes more intense or is further developed the temperature falls, and very often is below normal long before death.

Recovery from swine fever I have had no experience of, and until I have seen cases in which the so-called cicatrices of the swine fever ulcers are well marked, I cannot believe that pigs do recover from the disease.

The staggering gait of pigs affected with swine fever can easily be distinguished from cases of traumatic injuries or from those suffering from rheumatoid arthritis, and needs no explanation from me, except it be to say that in the case of swine fever there is no apparent local lesion to account for the extreme lameness and loss of power, whereas in the other the evidence is generally apparent.

Post-mortem Appearances.—The easiest way to make a post-mortem examination is to lay the pig on its back, open it from the sternum to the perineum, and expose the whole of the viscera. I then remove them and take a general survey of their exterior, particularly noticing the state of the mesenteric glands. Then separate the large bowels, taking with them 1 or 2 feet of the ileum, for unless lesions are to be found in the ileum I think that there is small chance of there being any in the duodenum or the jejunum. I then open the whole of the large bowel and the connected portion of the small bowel and empty them of their contents, and carefully wash in water to which has been added some disinfectant. Now examine the mucous membrane for one of the typical lesions, which are either patches of necrosis or the ulcerative lesion, or diphtheritic inflammation.

The ulcerative lesion is by far the commoner, and is most often met with in the cæcum and on and around the ileo-cæcal valve, though it is by no means uncommon to find no lesions here, but several in the colon. These so-called lesions are circular in shape, and of any size up to that of half-a-crown. In long-standing cases these ulcers may, as it were, grow into each other and form one large mass. They vary in number; there may only be a few, or there may be hundreds. They are grey or greyish-black in colour, are slightly above the level of the mucous membrane, they are concentrically ringed, and are surrounded by a zone of inflammation. The diphtheritic lesion is recognised by the formation of a white or yellowish-white fibrinous layer or false membrane over the mucous membrane of the bowel, generally found in the cæcum, but occasionally in the ileum. When lesions are found in the ileum they are more often of the diphtheritic type than of the ulcerative.

Sometimes lesions are found in the stomach, but it is rare to find any in the liver, kidneys, spleen, or bladder.

Treatment.—This being one of the scheduled contagious diseases, it is our duty, when we come across a suspicious case, to advise our clients to report it to the police. The police then report it to the Board of Agriculture *if* they happen to agree with our diagnosis, and the Board send their own appointed veterinary surgeon to inspect and report thereon, &c. When this report is received by the Board they decide whether it is a case of swine fever or not, and thus it will be observed that the opinion of the veterinary surgeon can be over-ruled either by the local police or by the Board. I must confess that it is not very often that the Board have contradicted the opinion I have given, but it has happened. In one outbreak I returned the case as being swine fever, but the premises were declared free. Then in about three weeks I was again instructed to visit, and returned it swine fever again, and with the same result; but shortly after more pigs were ailing and again reported, and I visited and reported it again swine fever, and then the Board of Agriculture agreed with me, and slaughter was proceeded with. In one other case I sent up bowel with ulcers as large as halfpennies on it, but the case was returned not swine fever, and the premises declared free and full compensation paid. I am well aware that mistakes will happen, and no doubt I have made many in connection with these cases, and who has not made mistakes who has had as many as 439 reported cases to attend to in six years?

I consider it a disgrace to the country that a police-constable has the power of contradicting and over-ruling the opinion of an expert on any matter, but as the law now stands he not only can, but does do so. And this is not to be wondered at when they receive orders not to report so many cases, and to use their own discretion more. These instructions may be useful for preparing statistics for the annual report, but they do not assist in stamping out the disease.

I consider that the most competent person to attend to the diseases of animals is the veterinary surgeon, and it must be admitted by all that we are not consulted as we should be on matters relating to swine fever. It would be out of place here to discuss the advisability of employing local or district veterinary surgeons, but we can discuss the advisability of employing veterinary surgeons or not. I think that I am right in saying that the veterinary surgeons on the permanent staff are paid about £50 a year less than the travelling inspectors, and yet the Board of Agriculture, in

their annual report for 1898, excuse themselves for employing travelling inspectors, because the cost in fees, &c., of a veterinary surgeon would be very considerable.

I am confident that were more duties entrusted to veterinary surgeons, the expense of the department would be less and the duties would be more efficiently carried out.

SNAKE BITE.

BY R. C. MOORE, VETERINARY-LIEUTENANT, ARMY VETERINARY DEPARTMENT, DEESA, INDIA.

SNAKE-POISONING is very common in India among the natives, where it is calculated that 20,000 die annually, but it is seldom the veterinary officer has a chance of attending animals, the victims of the deadly brutes. As I have seen one case in the horse, I will relate it, with the object of describing the peculiar symptoms more than anything else.

While out hunting one evening Major ——, who was hunting the hounds, suddenly turned in his saddle, and gave me warning of a snake he had ridden over. There I saw a huge cobra making off with his usual wriggle, and disappear into long grass. Dismounting, I looked over the horse most carefully, but could detect nothing, so off we went again, still wondering if the animal had escaped the fangs, when suddenly, within five minutes, it was quite clear the horse had been bitten.

Symptoms.—Sudden and excessive lameness on the off-hind; hair on the inside of the fetlock slightly coloured with blood, which was not noticed at first. On closer examination two small punctures could be seen, about three-quarters of an inch apart, which I opened with a pocket-knife, and allowed to bleed freely. Great pain, manifested by the foot being frequently lifted off the ground; pulse full and bounding; breathing rapid; dilated pupil, similar to what is seen after the administration of belladonna. All these symptoms were noticeable within ten minutes of the bite. Being in the jungle, no medicinal agents were at hand, and anti-renine was out of the question; however, by the aid of a speedy horseman we had brandy brought to the spot, and administered ten ounces in water. This seemed to brighten him up, and we were able to get him slowly home, about three miles. On arrival he seemed somewhat better, and five more ounces of brandy were given and wound cauterised, but it was only for a few minutes; then the leg began to swell to an enormous degree, the lymphatic glands in the groin became large, hot, and painful. Breathing rapid and stertorous, pulse now small and wiry, twitching of the lips, foaming mouth, drooping ears, an expression of stupor, the animal finally falling comatose in his box, and died four hours after the bite. Although the symptoms and death appear to be rapid, I am told that four hours is a long time for a horse to live after cobra bite, but this, I expect, greatly depends on the quantity of poison absorbed into the system. I regret now that I did not continue walking exercise, as the severe symptoms seemed to develop after being placed in the box. It is also to be regretted that anti-renine was not at hand, as the case appeared to be an ideal one for experiment.

[A case of snake-bite from a "Kariten Bungarus Cerulius" came under

our notice some years ago in India. The snake was brought into the stable in a bundle of grass, and bit the horse, a thoroughbred English stallion, in the upper lip. He was not treated in any way, as there were only natives round him. Death in this instance took place under one hour. He was seen a few minutes after death, but beyond the punctures caused by the snake's fangs there were no external marks, and an entire absence of any swelling.—J. A. N.]

CASE OF CHRONIC LAMINITIS TREATED BY LIGATURE OF THE DIGITAL ARTERY.

BY W. H. FLOOK, M.R.C.V.S., RICKMANSWORTH, HERTS.

On the 12th March 1902, I was requested to examine an aged cob gelding, that was lame on the near fore from chronic laminitis. I ordered shoeing with bar pads and cold applications to the feet, but without success, the animal always going lame after work. On March 22nd the cob was blistered round both coronets, and rested till 3rd May, when, as he was going round, he was shod. On May 15th he was taken a short journey, but came back as lame as before, and I told the owner that I did not think he would ever be fit for work on the road again, but that he might be of use on soft ground at a slow pace such as in a garden.

On May 21st I mentioned to the owner that the operation of ligaturing one of the plantar arteries might be performed, in these words :—"In my letter of the 16th I did not recommend any line of treatment for the cob, as I feared that none would be satisfactory, but in one of the medical journals for April a new departure is recorded, viz., ligature of one of the digital arteries."

The cob being an old favourite, the owner consented, and I operated on May 22nd, ligaturing the outer digital artery of both fore legs, just above the fetlock, in the same position as the operation of high neurectomy is performed, with the usual antiseptic precaution, the wound healing by first intention. I did not again see my patient till August 20th, when I find the following note in my case-book :—"Toe grown greatly, had to be pared away from the front." The toes had grown extremely long, and the toeing knife had to be used to remove about half an inch in thickness of the wall, which was much thicker on the near than the off foot, a new growth of healthy horn growing downwards from the coronet. On 4th September the cob walked quite sound, and the feet were much improved. On November 3rd he was put to work, and has performed it well, going sound ever since.

I saw him on July 8th of this year in the forge, and the smith who had shod him for a long period, expressed an opinion that his feet were better than he had ever known them before.

[The operation that was successfully performed by our correspondent was first, we believe, suggested by a French military surgeon, M. G. Joly, of the Samur Cavalry School. A paper giving details of some cases were published by M. Joly in the *Bulletin de la Société Centrale de Médecine Vétérinaire* of March 13th, and a translation in the *Veterinary Record* of April 19th, 1902, page 650.]

ALCOHOLISM IN HORSES.

BY MAJOR T. MARRIOTT, ARMY VETERINARY DEPARTMENT.

LUCKILY our patients are by nature total abstainers, but alas!—like man—they soon acquire the taste, and become very fond of certain forms of alcohol.

A brewer's drayman invariably gives his horses what he calls "the bottom of the barrels," and many hunters thoroughly enjoy a pint of ale after a very severe run. Maybe they will not drink any the first time, the second they will just take a little, and the third they will generally drink it eagerly. There is nothing better or more easily obtainable for a tired horse with a long track home.

This is using stimulants judiciously, but my object in writing is to describe the only three cases I have ever seen of anything like alcoholism in horses.

Case No. 1.—This occurred in a very nice fourteen-stone hunter, which was running in some regimental point-to-point races. Although this horse was all that one could desire as a hunter, the owner thought he would stand a better chance of winning if he gave the horse two glasses of whisky. Having done this the soldier-groom, to make assurance doubly sure, then gave the horse half a bottle more whisky unknown to the owner. Anyone who has hunted in Norfolk will recognise the fact that a horse wants to be perfectly sober to negotiate those banks and ditches which are both wide and deep. The result was just what might be expected. The horse fell into the first ditch, and the subsequent proceedings interested him no more.

Case No. 2.—A chesnut Arab horse, named Omdurman, imported to Egypt from Syria for racing purposes. As far as looks go this horse was good enough to win in first-class company, but looks are very deceptive, for instead of being a success he was an utter failure. In racing phraseology, he had the heart of a cow, and would not try a yard. He changed hands a few times, and disappointed each new owner. At one of the Alexandria meetings he was entered for two races the same afternoon, and advertised to be sold after the first race. Needless to add, he finished in his usual place, just about last. He was then put up to auction, and bought by a Greek for 96 Egyptian pounds = £98 : 10s.

Before competing a second time a bottle of whisky was poured down his throat. How much of it he swallowed, I cannot exactly say. The result was simply like magic, for from start to finish he ran clean away from the field and romped in the easiest of winners.

Case No. 3.—An aged troop horse, on the last day of this year's autumn manœuvres on Salisbury Plain, became so thoroughly exhausted that the man had to dismount and lead him back to the camp. Arriving within two hundred yards of the camp he stopped, and could neither be dragged nor pushed another yard. Half a bottle of whisky was administered, and when I arrived on the scene about half an hour later I found the horse down on the off-side, blowing, pulse good, sweating profusely, a peculiar rolling movement of the eyes, spasmodic twitching of the eyelids, the nose poised in the air, and apparently his one idea was to bore a hole in the ground with the back of his head at irregular intervals, when he seemed to awake from his drunken slumbers. These symptoms lasted for

four hours, when the horse got up, walked to his lines, and took his feed as well as if nothing had happened to him, Next morning the utterly forlorn and dejected look he was wearing gave one the idea that he knew something of a merry night bringing a sorrowful day.

I have since had the opportunity of examining this horse more thoroughly, and find that there is not only a well-marked jugular pulse, but a ventricular systolic murmur accompanying the first sound of the heart.

AN UNUSUAL FORM OF OAT-HAIR CONCRETION.

BY CAPTAIN E. BARRY, VET. OFFICER, 2ND LIFE GUARDS, HYDE PARK BARRACKS.

THE photograph (see illustration) represents what, in my opinion, is a unique specimen of an oat-hair ball.

The animal from which it was obtained was a nine-year old black troop mare belonging to the 2nd Life Guards, purchased in Ireland in August 1898. On the 1st February 1900 she suffered from an attack of colic, being on the sick list for four days, but had otherwise been in good health and condition.

On November 14th, 1903, she was admitted to the infirmary for an attack of abdominal pain, and treated in the usual way. There was nothing peculiar about the case, except the total stoppage of the bowels and the way the patient pressed her quarters at times against the wall kicking with one foot. An obstruction was suspected, and an examination several times made per rectum, but nothing could be detected. There was only uneasiness shown till the 21st, when the animal evinced great pain and died in the evening.

A post-mortem examination revealed the concretion firmly lodged in the colon at its junction with the cœcum. The specimen somewhat resembled a cocoanut with a loose kernel that rattled inside the outer shell, the nucleus, "which is shown in the right-hand half of the ball," being a piece of quartz. The weight of the concretion when removed from the body was 2 lb. 14 oz., somewhat ovoid in shape, the long circumference 16½ in., short circumference 15 in.; long diameter 5½ in., short diameter 4¾ in.; thickness of the outer shell ⅝ in. The specimen was shown for me by Lieut.-Col. Nunn at the meeting of the Central Veterinary Medical Society on November 3rd, and was considered to be a unique and rare one. The photograph gives a good idea of the kernel and outer casing. It is probable that the kernel formed in the first place, and moved its position about the time of the first attack of colic in February 1902, the outer casing subsequently forming in the new situation.

If this surmise is correct, it would give some data as to the rate of growth of these concretions, this one appearing to increase ⅝ in. in thickness in a little over three years and nine months.

NOTES ON LYMPHANGITIS EPIZOOTICA.

BY MAJOR J. BRODIE MILLS, INDIAN CIVIL VETERINARY DEPARTMENT, PRINCIPAL BOMBAY VETERINARY COLLEGE, AND CAPTAIN GLEN LISTON, INDIAN MEDICAL SERVICE.

AN outbreak of this disease took place in the city of Bombay in 1900-1901, and some investigations were made into the matter; the authors arriving at the following conclusions:—

It is liable to be mistaken for glanders, farcy, and Nocard's ulcerative lymphangitis. From the former it may be distinguished

A. That it is not acute, and runs a slow, subtle course.
B. Febrile symptoms are almost entirely absent.
C. Appetite remains almost unimpaired almost to the last.
D. There is no reaction to mallein.
E. The presence in pus from the abscesses of cryptococcus farcinemosa.
F. A greater tendency to ulceration of the tissues surrounding the abscesses in farcy.

From the latter—

A. By the presence of the cryptococcus and the absence of Nocard's bacillus.

Experiments were conducted with the following objects in view—

A. To determine what animals are susceptible.
B. To determine if the pus is directly infective.
C. To determine the maximum incubative period.
D. To determine if antiseptics and sunlight had any action in destroying the germs.

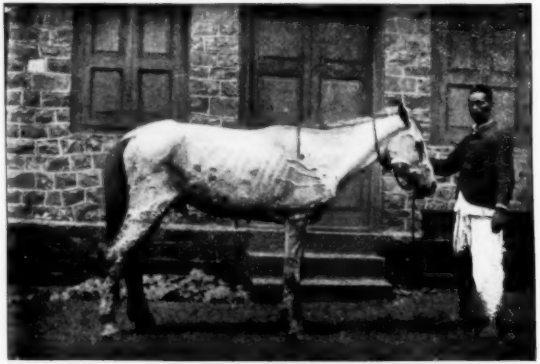
The authors arrive at the following conclusions regarding these points—

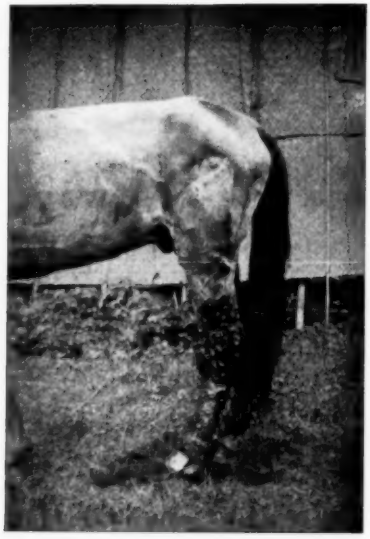
A. Rats and guinea-pigs are insusceptible, both by subcutaneous and intraperitoneal inoculation with pus. Horses, donkeys, and dogs are susceptible.
B. Pus from the abscesses of horses, donkeys, and dogs inoculated subcutaneously is infective to like animals.
C. With 1 cc. of pus, the maximum period of incubation was—horse, 54 days; donkey, 81; dog, 48.
D. Pus treated with a 5 per cent. solution of carbolic acid for fifteen minutes, or exposed in a thin film to the sunlight for a day caused no action with the first in 98 days after inoculation, and the second 78 days.

They summarise up the results of their observations—

1. That there is no doubt as to the existence of lymphangitis epizootica in Bombay.
2. That it is of an infectious nature.
3. That although it may appear to be temporarily cured, it is liable to recur, and have a fatal ending.
4. That an infected animal may spread the disease far and wide, although there may be no actual contact, and owing to the long period of incubation there is difficulty in tracing its origin.

ILLUSTRATING MAJOR MILLS' CASES ON LYMPHANGITIS EPIZOOTICA (see page 22).





5. It appears reasonable to suppose that the disease has been imported from southern Europe, "probably Italy," into India.

They also suggest certain sanitary measures to be taken, particularly as regards the importation of donkey stallions imported for breeding purposes into India from Italy and Spain, and forward a number of photographs of cases taken in Bombay (see illustrations).

PECULIAR CASE OF FOOT LAMENESS.

BY H. G. BOWES, F.R.C.V.S., LEEDS.

THE subject was an aged grey mare used in a milk float. When I was called in to her she had been more or less lame on the near hind leg for over a month, and was then very lame indeed.

I tried the foot, and found considerable tenderness there, although the history was not such as to suggest foot lameness, as one would have expected that if there had been any suppuration in the foot, the pus would have been out at the coronet long before then. However, I had the blacksmith up, and, after taking off the shoe, examined the foot, and found a small quantity of pus just on the inside of the toe, but there was no great amount of suppuration of the sole, only a bruising of it.

After applying antiseptic poultices for four or five days, the mare was sound, and I had the shoe on and sent her to work.

A week afterwards I was sent for again, and found the mare was as lame as ever. I was informed that she had worked a few days, going very well, and had then dropped lame again.

I again had the shoe off, and thoroughly explored the foot, and was surprised to find on thinning the sole down around the part where the suppuration had been, that as soon as the horn was removed the inflamed sensitive sole swelled out, raising quite a lump on the surface of the sole, and when pressure was applied to this with the thumb it was quite elastic, at the same time a sound as of suction being emitted. I cut through this portion of the sole with a sharp knife, and found a spherical cyst under the sole about the size of a large marble, the walls of which were cartilaginous, and containing cheesy matter. This cyst I dissected out, and applied antiseptic dressings for a few days (formalin); had the shoe on again, when the mare was perfectly sound; and I have heard nothing more of it for two months, so presume it is still working all right. Personally, I don't remember ever seeing a similar case before, where pus in the foot has become enclosed in a cartilaginous cyst instead of making its way out at the coronet, as is usually the case when it is not liberated below.

THE CHINA PONY.

BY MAJOR J. BRODIE-MILLS, INDIAN CIVIL VETERINARY DEPARTMENT, J.P., MAGISTRATE OF THE FIRST CLASS, FELLOW AND EXAMINER, BOMBAY UNIVERSITY; PRINCIPAL, GOVERNMENT VETERINARY COLLEGE, BOMBAY.

THE China pony is bred in the far North, on the Mongolian Plains, and when he is about five to six years old, he is brought down to the Treaty

Ports, mostly to Shanghai, for sale. He is then very much in the rough, and to look at is not at all a sightly nag. In shape he is a horse on short legs, long and low, a plain head, rather short neck, straight shoulders, and a long back; he has, however, plenty of bone, a good deal of depth, and generally good legs; his height varies from 12-3 to 14 hands, but the 13-hand to 13-1 ponies are decidedly the best shaped. When you first get on him you at once have a feeling that there is nothing in front of you, and as he carries his head low, especially in the gallop, you feel the reverse of comfortable until you get used to him. With his native owners he shows a very docile disposition, but usually he has a very different way of treating a foreign master, until he becomes accustomed to him. He has a mouth of iron, and will often take charge of you, but has a most wonderful knack of escaping collision; he has a great objection to hurting himself, and will pull up dead rather than run into anything. If you wish to test your seat you can find plenty of buck-jumpers among his species, but rearing is an accomplishment he does not thoroughly understand. As a racer he is wonderfully good for his size, carrying heavy weights, between 11 and 12 stones, over 1½-mile to 2-mile courses. If you get one of the right sort he is a good plucked one, and will struggle and stand hard riding for the last half or three-quarters of a mile of a long race in the most determined manner. He perhaps shows to the greatest advantage across country, going up and down the most impassable-looking banks, sometimes perpendicular, with the greatest ease, and if you trust to him he will rarely bring you to grief. Weight affects him but little, and it is often astonishing during the drag or paper hunt to see the game little fellow carrying a 12 or 13-stone man for a 10 or 12-mile gallop over about the roughest imaginable going, and taking jumps every few hundred yards, sometimes clearing as much as 12 to 15 feet of water. In former days English and Australian horses used to run in the races, but the custom has died out in favour of the China ponies.

INDIAN HORSE LORE.

BY MAJOR J. BRODIE MILLS, INDIAN CIVIL VETERINARY DEPARTMENT; FELLOW AND EXAMINER, BOMBAY UNIVERSITY; PRINCIPAL, GOVERNMENT VETERINARY COLLEGE, BOMBAY.

Lucky Marks of the Horse.

Feather-Marks or Bháwnris.

When you find only one feather-mark on the forehead it is called agni; the word agni is derived from a'g, fire.

If these feather-marks or bháwnris are more than one, they are called khosai he hal chal. Khosai means bunch; he hal chal means safe.

If there are two feather-marks on the forehead, one above and one below, the term used for it is ghagar; the word ghagar means raw. This mark is supposed to be lucky in Rajputána, but unlucky in the Punjáb.

When the feather-mark occurs on the bridge of the nose, just near the nostrils, or rather between the nostrils, it is called nansa verti. The word nansa means nose, and verti on.

The same feather-mark is called nasrát-yini in Persian, and the meaning of which is the same as the above.

When two feather-marks are so situated on the cheeks that one is just near the angle of the mouth and the other below the eye, they are supposed to be most lucky; and superstitious natives believe that no unlucky mark can be taken into consideration when these two are present. No special term is applied to these marks.

When two feather-marks are present on the throat by the sides of the trachea, they are called kantha; the word kantha means necklace.

When three feather-marks are so situated on the lower surface of the neck and a little above the chest, they are called devaman; deva means giant, and man means spirit.

When two feather-marks are so situated that one is on the cheek and the other on the neck just below the mane, they are termed Moobárak; the word Moobárak means welcome.

The feather-mark which is found at the root of the ear is called Karna-Mul; Karna means ear, and Mul means root.

When it is found on the tip of the ear it is called Karna-verti; Karna means ear, and verti means on.

When a feather-mark is found either on one or on both of the shoulders it is called angadi.

When a feather-mark is so situated on the outer surface of the skin that its head may be below and the tail above, it is called khunta-gar; khunta means peg, and gar means driving.

When five feather-marks are situated on the chest, they are termed panch-bhagt; panch means five, and bhagt means good.

Unlucky Marks of the Horse.

When two feather-marks are situated just above the temporal fossa, they are called do-ghir, meaning two houses.

When the feather-mark is situated on the neck and its head is towards the rider, it is called sarp or sanpan; the word sarp or sanpan means snake.

If one is situated on one side of the neck and two on the other side, they are called dwid bhagisanpan. Dwid means two, bhagi means side. If they are equal in number on both sides of the neck they are not supposed to be unlucky.

When the feather-mark is found on the withers it is called chatar-nihang; the word chatar means shell, and nihang means alligator.

All marks from the withers to the tail are supposed to be very bad.

The feather-mark occurring just on the seat of the saddle is called bys-khang; bys means bhang, and khang breaker.

When a feather-mark is found on the external wall of the nostril it is called nansa-verti; nansa means nostril, and verti on. It is a very unlucky mark.

If a feather-mark occurs just below the inner canthus of the eye it is called ansoo-dhar; ansoo means tears, dhar means flow.

When only one feather-mark is found on the chest it is called har daul; har means plough, daul means shape.

When a feather-mark occurs on the flank it is called bhasam cookh; bhasam means destruction, and cookh flank.

A feather-mark found on the arm-pit is called ganda bagal; ganda means rotten, and bagal arm-pit.

If the feather-mark is found anywhere underneath the girth it is called gome, which means a centipede. This is very unlucky.

When a feather-mark is situated on the belly in the median line it is called Ganga-pat; Ganga means Ganges, and pat width.

When a feather-mark is found on the testicles or on the sheath it is called anda or ling; anda means testicles, and ling penis.

If a feather-mark is found on the anus, or on the gaskin, or on the root of the tail, it is called dank oojar; dank means sting, and oojar destruction.

When a feather-mark is so found on the leg that the head of it is below and the tail above, it is called khoonta gar. It is a lucky mark; but, on the contrary, if it happens that the head of it is below and the tail above, it is called khoonta ookhar; khoonta means peg, and ookhar pull out; and this is the most unlucky. If both are present, they are also unlucky.

Superstitions Regarding Foals being Dropped at Different Parts of the Day.

(From the *Tamil.*)

I. If a mare gives birth to her young one in the first quarter of the night, the owner will become rich and his stable will be crowded with horses.

II. If a mare brings forth her foal in the second quarter of the night, a lucky son will be born to the master.

III. If a mare drops her foal in the third quarter of the night, the result will be that the master will get an income exceeding his expenses and his life will be a happy one.

IV. If a mare foals in the fourth quarter of the night, a very beautiful daughter will be born to the master, and will be married to a good husband.

The above results hold true for all the months with the exception of Chitra (April—May).

Contrarily, if a foal is born in the first quarter of the day, instead of the night, the master will become poorer and poorer every day, will get an income much less than his expenses, and will be afflicted with sorrow.

If a foal sees light for the first time in the second quarter of the day, the master will either become a sickly one, or become sorrowful, or die, or have to survive his children and perform their death rites instead of them performing his.

If the birth of a foal takes place in the third quarter of the day, the master will suffer much bodily pain, will be unceasingly sorrowful, and will have to perform death rites to his own children.

If a foal first draws its breath in the fourth quarter of the day, the owner will become a widower and an unhappy man.

These evil results will be the same for all the months of the year excepting the above mentioned Chitra (April—May).

If in the month of Chitra a foal is given birth to, the lifetime of the owner will be shortened, his riches diminished, and poverty increased; he will be subjected to various kinds of sorrow.

For counteracting these evil consequences, the owner should give alms

and cut the ear of the new-born foal, or give it as a present to a fakir (religious mendicant). If, however, he keeps it he will suffer great loss.

How to Determine the Age of a Horse.

(From the *Tamil.*)

The "Sástris" say in their "Sastrams" that change of colour takes place in the teeth of horses after five years, that each colour remains stationary for three years, and that by the change of colours the age of a horse can be determined.

When the natural colour of the teeth begins to change, the horse should be considered to have passed his fifth year, and three years should be added every time a change of colour takes place.

In conformity with the above statement there are nine colours of the teeth observable before the horse completes his 32nd year. The names of the colours are *Canlika*, *Arlica*, *Culica*, *Cauja*, *Maucka*, *Singa*, *Ulica*, *Languni*, and *Pesthi*.

Explanations.

I. When the teeth loose their natural colour and assume the colour of musk, or of smoke, the colour is called *Canlica*, and the horse should be considered to be seven or eight years old.

II. If the colour of the teeth be that of gold or of the teeth of deer, it is named *Arlica*, and the horse should have passed his tenth or eleventh year.

III. If the colour of the teeth appear to be a mixture of different kinds of red colour, or possess the colour of reddish black rice, the colour is said to be *Culica*, and the horse is deemed to be thirteen or fourteen years old.

IV. If the teeth have the colour of Cottakambu[1] after it is chewed with *Tambulam* (betel leaves, areca nut, and chunam), the colour goes by the name of *Cauja*, and the age of the horse is calculated to be sixteen or seventeen years.

V. When the colour of the teeth can be compared to that of the fly the colour gets the came of *Maucka*, and the number of years the horse has lived is nineteen or a score.

VI. If the colour of the teeth is not different from that of an oyster, *Singa*, a name given to that colour, the horse is twenty-two or twenty-three years old.

VII. If there be holes formed in the teeth, and a portion of the gum has been worn out and lost, such condition is called *Ulica*, and the age of the horse is then determined to be twenty-five or twenty-six years.

VIII. That condition in which the teeth of a horse are loose and movable, is named *Languni*, and the horse is then considered to have completed his twenty-eighth or twenty-ninth year.

IX. If the teeth begin to fall away, that condition is designated *Pesthi*, and the age of the horse is calculated to be thirty-one or thirty-two years.

[1] A dry extract made of the leaves *Namelea acubata.*

THE VETERINARY ASSOCIATION OF MANITOBA.

BY F. F. TORRANCE, SEC., TREAS., AND REGISTRAR.

THIS association held its semi-annual meeting in Portage la Prairie, on Thursday, July 16th, the President, Mr. W. R. Taylor in the chair. Members present—S. A. Coxe, Brandon; W. A. Dunbar, Winnipeg; W. S. Henderson, Carberry; G. Hilton, Portage la Prairie; W. Leslie, Melita; W. E. Martin, Winnipeg; W. A. Shoults, Gladstone; W. Swinerton, Carberry; W. R. Taylor, Portage la Prairie; F. Torrance, Winnipeg. Visitors—J. Wilson, Wingham, Ontario; A. Swinerton, Carberry; and F. Z. Woods, Winnipeg.

After the reading of the minutes, a communication from Dr. Rutherfurd of Ottawa was read, urging the members to attend the meeting of the American Veterinary Medical Association in Ottawa, during the first week in September. The secretary spoke upon the many advantages of attending meetings of the A.V.M.A., pointing out that this is the first meeting to be held on Canadian soil, and the importance of every Canadian practitioner attending and helping to make it the largest and most successful meeting held yet. Several spoke in the same strain, and many announced their intention of going to Ottawa.

The meeting then adjourned to the infirmary of Dr. Hilton, where a clinic was held. Two cryptorchids were castrated by Dr. Wilson, a right and left abdominal case. A bad case of roaring was presented for operation, but Dr. M'Gilvray, who had promised to operate, failed to appear, being detained at the Minnedosa Fair judging horses, and the operation was postponed.

A case of chronic lameness in the fore foot, with a history of over a year, was operated upon by Dr. Torrance. A median neurectomy was performed, the animal showing immediate improvement. The next case was abdominal hernia, no history, except that the animal was found at pasture presenting a large soft swelling near the left flank. Dr. Dunbar operated, making an exploratory puncture, followed by incision, but, finding evidence that the hernia was of long standing, the incision was closed without attempting a radical operation.

This closed the clinic, which, as the first held by the Association, was considered very successful. Votes of thanks were passed to the operators, and to Drs. Taylor and Hilton, who formed a local committee of arrange ments, and to whose efforts much of the success of the meeting was due. The meeting then adjourned.

[We are glad to publish this account of the meeting of the Veterinary Association of Manitoba, which we have received from the secretary. It always gives us pleasure to be able to hear of the doings of our professional brethren in distant parts of the world, and we would be glad to receive more reports of a like nature from representatives of Colonial Veterinary Medical Associations. We are not among those who hold that we in England have nothing more to learn; the late war in South Africa has shown that some of our *confrères* from beyond the four seas are able to instruct us in certain matters. We particularly notice the large clinic, held at the meeting of the Manitoba Association, and think this a point well worth the attention of English societies, more especially as the secretaries of some complain of the difficulty of getting papers for discussion.]

REPORT OF THE BOMBAY VETERINARY COLLEGE.

THE annual report of the Bombay Veterinary College for the year 1902-3 has just been issued.

For the Diploma or English course 44 students presented themselves for examination, and 33 passed; for the "Salutrie" or Vernacular course 67, of which 48 passed. On March 31, 1903, there were 136 students on the books of the College, viz., 69 in the English and 67 in the Vernacular class. The different nationalities is curious, comprising Hindus, Parsees, Mohammedans, Buddhists, Native Christians, Portuguese, Eurasians, and Europeans.

The Hospital returns are:—

In-patients 2618, against 1642 in 1901, or an increase of 976, comprising—horses 614, cattle 1729, dogs 217—a daily average of 8·53.

Out-patients 649, against 710 in 1901.

The mortality was—horses 4·07, cattle 2·54, dogs 27·27.

Operations—60 on horses, 530 cattle, 19 dogs, 4 sheep and goats.

In reviewing the report His Excellency the Governor in Council agrees with the Director of Public Instruction in thinking that the College was successfully administered during the year, and notes with satisfaction the increased attendance in the Diploma class. The percentage of passes also is creditable, and that of first-class men very good in the second year's Salutri class. If the existing standard is maintained, the College will turn out a very substantial number of diplomates and trained veterinarians every year, with every prospect of ultimate advantage to the people, by diffusion of knowledge of rational and scientific treatment and care of animals useful for agricultural puposes.

TO OUR READERS.

We beg to announce that with this number a series of Original Articles is commenced, from the pen of Lieut.-Colonel Nunn, on "Veterinary Toxicology." It is expected to publish these articles in book form at the conclusion of the series.

VETERINARY TOXICOLOGY.

BY LIEUT.-COLONEL J. A. NUNN, F.R.C.V.S., F.R.S.E., C.I.E., D.S.O., BARRISTER-AT-LAW, DEPUTY DIRECTOR-GENERAL ARMY VETERINARY DEPARTMENT.

PART I.—GENERAL TOXICOLOGY.

I.—DEFINITION.

TOXICOLOGY (from the Greek words τοξικον poison and λογος a discourse) is defined by *Hugounenq* to be "that section of biology which treats of poisons in relation with living creatures." This definition leads on to the question, "What is a poison?"

According to Fodéré and Orfila poisons are "Any substance which, taken internally, or applied in any way to the living body, are prejudicial to health or destroy life." Devergie's definition is, "All substances which, taken internally or applied externally to

the body, that are capable of altering the health or destroying life without acting mechanically or reproducing themselves." But this definition is faulty, as it would not include certain substances, such as powdered glass, that act mechanically, or micro-organisms which are capable of multiplication. Littré and Robin describe a poison as "Any substance which, if taken into the body by cutaneous absorption, during respiration, or by means of the digestive system, acts on the tissues in such a manner as to endanger life, or to cause death in a short space of time"; and Vulpian, "All substances introduced by absorption into the organisms that give rise to structural alteration or functional disturbance of greater or less intensity, and whose action, when it reaches a certain degree of severity, is capable of causing death or endangering life."

These different definitions from high authorities show the difficulty, if not the impossibility, there is of including all poisonous substances in one concrete sentence; and Tardieu says, "Poisonous properties are never absolute, and are dependent, not on the nature of the substance, but on accessory conditions such as the dose used, method of administration, &c."; as, for example, arsenic and strychnine, which, in certain quantities, are violent and deadly poisons, and in others valuable remedies. The same may be said with regard to hydrocyanic acid, digitaline, and many others. Taylor (*Poisons*, 3rd edition) gives three supplementary definitions—viz., the *popular, legal, and medical.* With regard to the first, he says, "A poison is commonly defined to be a substance which, when administered in small quantity, is capable of acting deleteriously on the body"; or to the second, "A poison is a substance which, when absorbed into the blood, is capable of seriously affecting health or of destroying life." Taylor allows that this definition is faulty, as there are some substances, such as the mineral acids and alkalies, that are corrosive, and destroy life by the changes they cause in living tissues and the resulting inflammation.

On the Continent the giving of poisons is specially provided for by the legislature; in France, to human beings by Articles 301 of the Penal, and 1382 and 1383 of the Civil Code; to animals, by Articles 452 and 454 Penal Code; in England, where the law is not codified, by the Drugging of Animals Act of 1876 (39 and 40 Vict. chapter 13).

Although at first it may seem a simple matter enough to distinguish between a *poison* and a *medicine*, on reflection it will be found that the border line is ill defined, the species, sex, and individual all being factors to be taken into consideration; as, for instance, carbonic oxide, which is so fatal to man, is much better tolerated by the rabbit, and this animal is almost immune to the effects of belladonna.

The study of toxicology is intimately blended with other biological sciences, particularly physiology and chemistry, both of which it on many occasions even overlaps, especially the latter,

and, in addition, a knowledge of botany, zoology, and pathology are required, as the effects produced by a poison are diseased conditions.

2.—CLASSIFICATION.

The necessity for the classification of poisons became apparent to both medical men and lawyers at a very early date, and several different systems have from time to time been prepared based on different facts, but up to the present a really satisfactory one has not been arrived at.

In 1785, Jacob Plenck placed poisons according to their origin—viz., animal, vegetable, mineral—those contained in vapour, and those given off by the volatilisation of certain substances.

In 1801, Mahon, the first Professor of legal medicine at the "Ecole de Paris," reduced Plenck's classification to three—viz., animal, vegetable, and mineral, placing both volatile and fixed poisons in one or the other categories.

Huseman, in 1862, proposed two groups, organic and inorganic. Amongst the first he placed the animal, vegetable, and mineral poisons; in the latter, the metalloids, metals, and their compounds.

Orfila classified poisons according to their effects; also Tardieu, the latter author, distinguishing them as irritants or corrosives, hyposthenics, stupefactives, and neurosthenics.

The tendency now is to classify poisons, not on the symptoms they give rise to, but the way in which they act; and this has been adopted by Taylor, Claude Bernard. and Rabuteau. The following is Rabuteau's classification:—

Hematics, .	Poisons acting on the blood globules.
	„ „ „ plasma.
Neurotics, .	Poisons paralysing motor nerves.
	„ „ sensory nerves.
	„ „ cerebro-spinal system.
Neuro-muscular.	
Muscular.	
Irritants.	

This classification of Rabuteau's, which is rational in principle, is a long way from being perfect, as there are many poisons whose effects are not well known; and others that are complicated, and which permit them to be placed in more than one group.

Bouis's classification is what has been adopted by most continental writers on the subject, and, although it is artificial and arbitrary, it has the advantage of being simple, and is really what would be adopted in the analysis for an unknown poison. It is as follows, and is what is proposed to be adopted in the following pages:—

Simple bodies and their compounds,	Metals and their compounds.
	Metalloids and mineral acids.
Gas and vapours, . .	Gas.
	Vapours.

Organic substances, { Organic acids. / Organic bases, { Alkaloids. / Different organic bases. } / Various poisonous substances. }

3.—ETIOLOGY.

Mode of Entrance of Poison into the Body.—It is extremely rare that poisons are taken into the body in a pure state; they are usually mixed with some substance that acts as a vehicle, and which in many cases greatly modifies the effects. It may act as a solvent and facilitate absorption, or it may, on the contrary, retard it by preventing solution; by its chemical action the nature of the poison may be completely changed; or by disguising the taste the animal may take the mixture voluntarily.

Spontaneous, Accidental, and Intentional Poisoning.—Spontaneous poisoning takes place from the food or the air breathed, and domestic animals are much more subject to this than wild ones, as they are more likely to come into contact with such substances when hungry. The sense of taste is not very acute in ruminants, and poisoning from such substances as colchicum, tobacco, ergot of rye, and mildewed wheat, is by no means uncommon. With the smaller animals, such as dogs and cats, poisoning by food cooked in copper vessels, lead poisoning from water, and salt in the form of brine, are well known.

The air breathed may contain volatile poisons or gases, such as fumes of mercury, small particles of metal in the shape of filings, sulphuretted hydrogen, carbonic acid, coal gas, &c.

Accidental poisoning is the most frequent with the domestic animals, either in the form of medicines not being sufficiently diluted, too large doses being given, or the drug being continued for too long a period.

Intentional or malicious poisoning is generally through the food, the victims usually being dogs or small animals. It may be perpetrated from feelings relating to the animal itself, such as a fierce dog that has bitten some one, or from personal resentment against the owner or owners, of which a good example is the poisoning of hounds.

Channels of Entrance.—The various mucous membranes and the skin are usually the portals through which the poison is absorbed. No doubt poisoning sometimes takes place by introduction into the subcutaneous cellular tissue, the different serous cavities, and even directly into the circulation, but the most usual portals are the digestive and respiratory systems, with the food or air.

4.—PATHOLOGY.

Local Effects.—These are the results of the action of the poison on the living surface that it comes in contact with, and generally

consist of more or less diffused irritation, varying in degree from congestion or inflammation to mortification, and which local effects react on the whole system, giving rise to fever, collapse, &c. These effects are not uniform, and depend on many circumstances such as the nature of the poison, the vehicle it has been administered in, the dose, the surface it has been absorbed from, and the conditions that exist in that surface, such as whether the stomach is empty or the process of digestion going on.

Absorption.—Most authorities state that absorption is necessary before poisoning can take place, but this is hardly correct, as it only takes place in the case of soluble or volatile substances. The nature of the absorbent surface has to be remembered, as, for instance, unbroken skin, which readily absorbs gases, only takes up a very small portion of any other material. Skin altered either by mechanical irritation, such as friction, an irritant or vesicant, becomes very absorbent, also wounds, in which in some cases the vessels will allow of direct access to the circulation.

All the mucous membranes, and more especially the gastro-intestinal, allow ready absorption of poisons, also those of the respiratory system, which not only allow of the passage of gas, but also substances dissolved in dialysable fluids. The serous membrane and subcutaneous cellular tissue are also absorbent, and when a poison is introduced directly into the current of the blood, grave results follow almost at once. Other conditions may cause the degree of absorption to vary, such as the nature of the vehicle, the condition of the membranes, and even the state of health of the patient. Certain substances, by their action on the vaso-motor system, contract the capillaries and retard absorption. The state of the stomach and intestines must also be considered, viz., whether they are full or empty, and, if full, the nature of the contents. Animals that are in a weak state either from loss of blood or wasting disease absorb poisons much more rapidly and completely than healthy ones.

These various reasons show that it is not possible to lay down a hard and fast rule as to the dose of poison given and the quantity absorbed, and furthermore it must be remembered that a portion may be lost by vomiting, as well as passed in the fæces, particularly if there is diarrhœa.

Circulation.—Once the poison is absorbed, it is carried to various parts of the body by the circulation, and its special results are then made manifest, and here the part of the body from which absorption has taken place must be remembered, as this has a considerable influence on the symptoms. Most poisons before they can produce any result have to gain access to the circulation, but in transit a considerable portion may be retained in some special organ or organs, or eliminated from the body, as for example, one that is absorbed through the stomach or intestines may have a large portion either retained in or eliminated by the liver; or, if volatile,

exhaled by the lungs. For this reason, sulphuretted hydrogen is less poisonous when taken by the stomach, and the potash salts, which are very poisonous when injected intravenously, are in the stomach inert.

Deposition.—Most poisons are found dissolved in the blood plasma, but some only in the red corpuscles having undergone in many cases changes in their constitution which will be discussed under each special heading, but the majority of the metals are in the form of chlorides combined with albumen; phosphorus and arsenic remain unaltered.

Some poisons have an affinity for certain tissues or organs, and the effects they produce to a considerable extent depend on their power of selection. These are chiefly metals, and lead, arsenic, and mercury can be given as examples, the liver being the principal organ in which they are to be found; in it also are deposited most of the alkaloids in various forms, which will be mentioned further on. This deposition, as well as the process of elimination, diminishes the quantity of the poison in the circulation, and retards the appearance of, or lessens the severity of the symptoms.

In certain cases the process of deposition is the result of the formation of a more or less stable compound from the poison in combination with the protieds of the tissues.

Elimination.—Poisons in the blood are eliminated in the excretions in exactly the same way as those that are deposited in the various tissues. The time occupied in this process greatly varies, but, if the patient survive, in a longer or shorter time no trace is found in the body. Dr. Geoghegan found that arsenic continued to be deposited in the liver for fourteen hours after administration, after which time the quantity diminished and entirely disappeared in from fourteen to seventeen days. Orfila's observations are the same. Taylor gives a series of cases that go to prove that if the patient lives from fourteen to twenty-one days arsenic is not likely to be found in the soft tissues, and that under proper treatment it may disappear in a few days from the contents of the stomach and intestines.

Elimination will take place through the kidneys of nearly all the mineral poisons; many alkaloids, alcohol and chloroform, mercury, and many other metallic salts, through the liver in the bile, although some of them, passing with it back into the intestines, may be reabsorbed, hence elimination by this channel is slower and more uncertain than through the kidneys.

Gases, vapours, and volatile poisons are eliminated by the lungs, and their peculiar smell in the breath will often be a valuable indication; the same with the skin, which eliminates many volatile substances, especially alcohol.

The salivary glands, those of the skin, and various mucous membranes also all help to eliminate poisons, but not very actively. Chattin has found traces of arsenic in serum from a blister.

Some poisons are eliminated unaltered, especially those derived from the vegetable kingdom—such as strychnine, morphine, and cicatine, also chloroform; but others undergo change during the process—either during absorption or after they have gained access to the general circulation. Rabuteau gives the following changes which he has demonstrated by experiment:—sulphides, sulphites, and hyposulphites into sulphates; cyanates, acetates, tartarates, matates, citrates, formiates, valerinates, quinates, meconates, alkaline succinates, &c., into carbonates, ferriccyanide into ferrocyanide; perchloride of iron into protochloride; iodates and bromates into iodides and bromides; tannic into gallic acid; and the compounds of oxygen and phosphorus into phosphoric acid.

The *time* it takes for a poison to be eliminated is one of much practical importance, and greatly varies not only with the particular poison but the dose given, the period over which its administration has extended, and the condition in which the excretory organs are in. Certain substances remain a long time in the body, and others cause such changes in the tissues that the functions are altered or impaired, and they cannot be got rid of; also the repeated administration of small doses may so saturate the organism that elimination can only take place very slowly.

5.—PHYSIOLOGY OF POISONING.

The way in which poisons act has given rise to much discussion, and even now the matter is not satisfactorily settled. Mosselman and Hebrant classify their mode of action under three headings:—(1) By deoxygenation of the blood, chiefly by derivatives from the vegetable kingdom, such as citrates, tartarates, and oxalates; these are turned into carbonates at the expense of the blood, which is left with insufficient oxygen, and consequently asphyxia takes place; (2) by the formation in the body of stable compounds, which cause such alterations in the nutritive functions of the tissues as to be incompatible with life; most of the metallic poisons—copper, lead, mercury, arsenic, and antimony—act in this fashion; (3) those substances that do not give rise to material lesions, but whose action is dynamical.

Translations and Extracts.

AN UNUSUAL CASE OF LAMENESS.

BY M. P. FORGEOT, AIDE VÉTÉRINAIRE REMOUNT DEPARTMENT, MACON.

THE patient was a brood mare five years old that suddenly fell very lame on the near fore-arm while out at grass. She was seen by a veterinary surgeon who diagnosed a strain of the shoulder, and prescribed for her, ordering rest. In a fortnight she went sound and was turned out, but after galloping a short distance again fell lame. She was again treated, but

without much result, so was sent to the depôt at Macon very lame indeed. There was no visible lesion or mark of injury either on the shoulder or foot, so cocaine was tried for diagnostic purposes. Hydrochlorate of cocaine 0·30 grammes, distilled water 5 cc., an injection of 2·50 cc. being given on each side of the fetlock without any result. Two days after the same was given over the median nerve with the same result, but a third in the muscles surrounding the scapulo-humeral articulation caused great temporary relief, confirming the previous opinion of a lesion to the shoulder.

The animal then became attacked with strangles, and was under treatment for some time till December 10th, 1902, when MM. Flakault and Cagny's plan was adopted of injecting 5 cc. of a saturated salt solution, 1000 grammes bichloride of mercury—1 gramme round the scapulo-humeral articulation.

The next day the limb was painful and swollen. On the 18th the limb was kept flexed; on the 22nd the muscles of the shoulder were no longer painful, although those of the fore-arm at the upper part were exceedingly so, and swollen. A blister was applied over this region, and the salicylate of soda given internally; on January 1st 1903 the lameness had greatly decreased, and continued to do so till the 18th, when the patient was seized with an acute attack of hepatitis, which she died of two days afterwards.

On post-mortem examination the muscles of the shoulder and the scapulo-humeral joint were perfectly healthy. The muscles round the elbow were infiltrated and black over the region corresponding with the pain shown during life. The extremities of the radius and humerus had on them exostoses corresponding to the insertions of the lateral ligaments, largest internally (see illustration fig. 1). The humeral insertion of the capsular ligament is shown by the undulating and roughened line (fig. 2 *a*); the radial insertion is, however, less clearly marked. The lateral ligaments of the radial ulnar articulation appear to have been strained from the small exostosis existing at their insertions.

There was a remarkable exostosis about the size of a nut on the external surface of the olecranon (fig. 3 *a*), about $\frac{3}{8}$ inch from the break, also one the size of a pea in the fossa, both of which during progression must have caused great mechanical lameness.

All the articular ligaments were indurated and partly ruptured, and the joint distended with a dark yellow-coloured synovia; there was slight ulceration of the median groove up the articular head of the humerus.

The lesions make it reasonable to suppose that there had been a sprain with a twist from within outwards of the humerus on its axis, implicating the ligament, and giving rise to the exostoses.

The post-mortem shows that the diagnosis was wrong, and that the seat of lameness was not in the shoulder but the elbow joint, and that we should not have omitted treating it with cocaine.

(*Recueil de Médecine Vétérinaire*, Sept. 15, 1903.

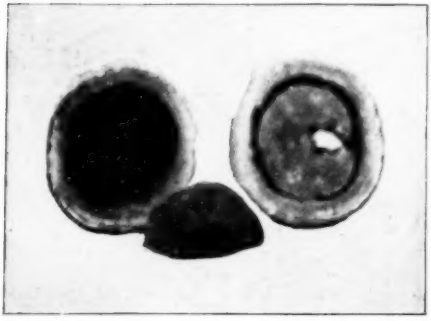
ILLUSTRATIONS IN M. FORGEOT'S ARTICLE ON AN UNUSUAL CASE OF LAMENESS (see page 36).

FIG. 1.

FIG. 2.

FIG. 3.

CALCULUS IN CAPTAIN BARRY'S CASE ON OAT-HAIR CONCRETION (see page 21).



ACTION OF HUMAN, BOVINE, AND AVIAN TUBERCLE BACILLI ON CATTLE AND SHEEP.

MAFFUCCI (*Clin. Modern.* an. 9, n. 54) publishes a full account of his experiments on this subject. His conclusions are as follow :—The bacillus of bovine tuberculosis is widely pathogenic for the same species of animal. Human tubercle baccilus causes in cattle a transitory lesion which heals, causing, however, tropic disturbances which may slowly disappear. The ox is capable of of becoming habituated to strong doses of virulent human tubercle bacilli injected into the veins. Tuberculous products derived from the corpses of human beings and subcutaneously injected into calves have determined a lesion, which, however, remains strictly local, and slowly heals. The reverse of this occurs with bovine tuberculous products. Calves intravenously injected with human tubercle have shown no trace of consumption after eight months, and yet fifty days later, after a strong injection, develop grey tubercles in the lung. The bacillus of human tuberculosis may remain alive in the tissues of the calf if the resulting abscess is encapsulated. Avian tubercle is powerfully toxic for calves when intravenously injected. The tuberculin reaction (practised with human tubercle bacilli) is positive in oxen and sheep. Sheep resist human tuberculosis less than calves if the bacilli are injected into the veins. It is possible to induce in cows a certain amount of immunity against pearl tubercle if they are previously treated with strong cultures of human tubercle.

(*British Medical Journal*, Oct. 24, 1903.)

ACUTE GLANDERS IN MAN.

GUTOWSKI (*Arch. Gén. de Méd.*, September 1st, 1903) describes in detail a case giving the clinical symptoms and the bacteriological confirmation of the diagnosis. In the absence of any clear etiological indication glanders was not suspected until late in the course of the disease. The patient was aged thirty-three, and worked in a foundry; had contracted syphilis ten years previously, and had undergone two courses of treatment. The attack commenced with symptoms of influenza, and on the sixth day a right-sided pleural effusion was detected. On the eleventh day a patch of erythema with subcutaneous infiltration appeared over the right ankle-joint. On the twelfth a rhinological examination revealed no changes in the upper respiratory passages. In the evening of this day consciousness was lost, and urine and fæces were passed involuntarily. Half a grain of Marmorek's antistreptococcus serum was injected. On the thirteenth two small pustules appeared on the forearm resembling varicella. Microscopic preparations of the pus revealed bacillus mallei, and the same organism was then recovered in pure culture from the pleural fluid removed by exploratory puncture. No organism was recovered from the blood; leucocytosis was inconsiderable. The subcutaneous infiltration was diminished after the first injection of serum, and in view of the possibility of a mixed infection 20 grams were injected on the thirteenth and fourteenth days of the disease, 10 grams on the fifteenth. Fresh pustules continued to form on the limbs, trunk, and face, and the patient died on the seventeenth day. No necropsy was obtained. A culture of the organism on potato was characteristic. Animal inoculations

confirmed the diagnosis of glanders. The testicular abscesses in the guinea-pig contained pure cultures of bacillus mallei. The case is interesting from the fact that the patient had no contact with horses, that no indication as to the mode of infection could be given by the patient or inferred from his surroundings, and that no point of inoculation was found. Referring to the contagiousness of glanders from man to man, the author points out that its recognition dates from the sixth century, but is of opinion that the degree has been much exaggerated; and he classes it after measles, scarlatina, small-pox, and typhus. Numerous cases are quoted in support of this opinion. He attributes this to the fact that the bacillus mallei will grow upon certain soils and under certain biological, chemical, and physical conditions. It is not inoculable in the ox, white mouse, rat, or old dog; it will not grow at the temperature of the room; it dies in a few days if grown on potato at 37° C. Further, there is no spore formation. He points out that glanders in man occurs most exclusively in those intimately connected with horses, whereas we are all more or less exposed to the sniffing and snorting of glandered horses in the street. Giuseppe Cao has shown that bacillus mallei passes through the digestive tract of the cockchafer, and retains its virulence; and the author suggests that flies and insects may convey the infection from stables to neighbouring living quarters. With regard to malignity he has never seen a case of acute glanders at the Hospital St. Stanislas recover; and regards the published cases with doubt, as they lack a precise bacteriological diagnosis. He advocates strict isolation, and long inspection of apparently cured chronic cases. For a rapid diagnosis he injects several male guinea-pigs subcutaneously with at least a demigram of the suspected material; the others intraperitoneally with 2 to 4 decigrams. Pus from the most recent infiltrations is employed. The classical testicular swelling may occur from other organisms, especially if the injection deviate from the median line, and may be altogether absent, as Leroy and Steinmetz first showed. The author has used a modification of Mari's method with good results. Kittens are inoculated with the pus; after forty-eight hours they are killed, and the blood from the spleen is grown upon glycerine agar in Petri dishes, and after forty-eight hours' growth isolated colonies are transferred to potato, when the characteristic growth is obtained. Six days are required for this process. He regards mallein as useless as a diagnostic agent; for a rise of temperature may occur in the healthy subject, and no rise in undoubted cases of glanders in horses. As a therapeutic agent it is harmful, exercising a hæmolytic action, a fact first pointed out by Prouss.

VETERINARY INSPECTON OF HORSES.

At a recent meeting the Council of the Shire Horse Society had the question of Sound *v.* Unsound sires under consideration. The president—Sir Alex. Henderson, Bart., M.P.—raised the question, as he thought there should be something done to protect breeders against the use of unsound sires. Captain Duncombe and Lord Verulam both spoke in favour of the Board of Agriculture taking in hand the work of inspecting entire horses, and giving certificates of soundness to such of the horses as passed the test, all horses which had not got that certificate of soundness to be held as unsound. Probably in that case, also, the Board would be asked to

publish a list of the horses that had been certified as sound, all the others being held as being on the "Black List." Up to this stage in the proceedings it seemed as if the Council, under the friendly lead of the president, were to be unanimous in calling upon the Board of Agriculture to undertake the inspection and certification of all sound horses, and the "black-listing" of all unsound entire horses. And as buyers of commercial horses have as much need of "Protection" as breeders have, the Board of Agriculture would have next been called upon to undertake the official inspection and certification of all horses, whether entire and pedigreed, or otherwise. But Sir Walter Gilbey and Sir P. A. Muntz soon put a spoke in the wheel. Sir Walter asked the Council if they had considered the difficulties that would arise through the differing of veterinary experts? Then Sir P. A. Muntz asked how it would look if a horse which was certified as sound at the Shire Horse Show were to be cast as unsound by the veterinary inspector of the district in which he was travelling. These were questions which those who were crying out for Board of Agriculture inspection and certification could not answer, and the president hastened to say that he would not ask for the opinion of the Council by taking a vote on the subject. But although Sir Walter Gilbey and Sir P. A. Muntz have, by means of a couple of very pertinent questions, given the happy despatch to this scheme of Government inspection and certification, they have brought themselves face to face with another equally pertinent question. At the shows of the Shire Horse Society, as well as of the Royal and several other English Societies, the horses selected as prize-winners have to be "vetted" and passed as sound before the prizes can be awarded to them. Numerous cases have occurred before where horses cast by the official inspectors at these shows have been examined and certified as sound by veterinary experts, at least as capable and eminent as those who cast the said horses as being unsound. Is it not the case, therefore, that the condemnation passed by Sir Walter Gilbey and Sir P. A. Muntz was an equally emphatic condemnation of the system of "vetting" horses which is adhered to at the Shire Horse Show, the Royal Show, and numerous other English shows?

(*North British Agriculturist.*)

THE TUBERCULIN TEST.

CLOSELY allied to the subject of the proposed Government inspection and certification of horses is the subject of the testing of cattle for soundness. Some facts that have lately come to light on this point are at present the subject of much animated discussion among shorthorn breeders. It appears that last autumn one of the best known exporters of high-class shorthorns to the Argentine got 35 per cent. of his cattle condemned and destroyed at Buenos Ayres on account of their having reacted to the tuberculin test when they were tested by the Argentine Government inspectors. These cattle were all bought subject to the test, and before being taken delivery of by the exporter, they were all certified as having stood the test and come out clear. Sir Oswald Moseley lately stated that he knew how to render the test ineffective, and Principal Williams has lately been explaining that the test can easily be rendered ineffective by the use of strong sedatives, such as laudanum, morphia, and aconite. Whether any such

means of rendering the test ineffective had been practised on these cattle, or whether the Argentine Government inspectors had made a mistake, can only be surmised. But certain it is that the cattle, including some of the principal prize-winners of the year, were certified as non-reacting before they left this country, but they were condemned as reacting when they were tested in quarantine at Buenos Ayres. It appears also that a number of other high bred cattle, including several notable prize-winners at last season's shows in Great Britain, were sold for exportation to the Argentine subject to the test, but as the animals reacted they were rejected by the buyers. Later on in the season, however—in fact, just about the time that Principal Williams' article showing how the test could be rendered ineffective appeared in the *Veterinary Journal*—these same animals were sold to another buyer for the Argentine, and this time they were certified as having passed the test. How these cattle will fare at Buenos Ayres remains to be seen, but some rival exporters are to watch with no little interest as to how they stand the test. It appears also that a big number of the highest-priced animals, all of which on account of their high value had been heavily insured, took sick and died in the course of the passage. In fact, the mortality among the highest-priced animals which had been insured was so heavy that the companies have intimated that they will not insure any more high-priced animals. There is reason to fear that these and various similar facts which have become known, will considerably affect the export trade in pedigreed cattle to the Argentine next year.

(*North British Agriculturist.*)

PERIODIC ŒSOPHAGISM.

BY DR. W. SELLMANN, NEW YORK.

A SEVEN-YEAR-OLD trotting mare had for the past six months been subject to attacks of vomiting about half an hour after her midday feed, and less frequently after the evening one. The attacks occurred about four or five times a week. The attacks lasted for about one or two hours, and during this time the mare hung her head and stretched out her neck, looking anxious and giving vent to frequent moans. A variable amount of food was ejected through the mouth and nostrils. The case was complicated with dyspnœa and tympanitis, and presented symptoms of chronic intestinal catarrh. The mare was in exceedingly bad condition.

At first either a diverticulum or constriction of the œsophagus was suspected, but as the patient always had a good appetite, the symptoms had existed for some time, and nothing could be detected by examination, this was dismissed.

The teeth were normal, but the animal was a wind-sucker, so it was decided to perform Dieckerhoss's operation of section of the sterno-thyroid and sterno-hyoid muscles. During the first three weeks after the operation there were two slight attacks of œsophagism, since which time they have ceased. The author has had the mare under observation for two years. She is in good health and condition and does her regular work.

He has since operated successfully on three other cases of wind-suckers that suffered from colic.

(*Berlin Thierärztl. Wochenschrift*, 18th May 1903.)

URTICARIA IN THE COW FROM RETENTION OF MILK.

BY MM. HALLIER AND DELAUNOY.

THE authors have noticed a dangerous form of urticaria in the cow in animals that have not been milked for forty-eight hours previous to sale in order that they may show a full udder. The disease is well known to dealers and breeders, who unanimously attribute it to retention of milk. The attack commences with salivation and slight colic, and then very suddenly the vulva and eyelids are infiltrated and swollen. The mammæ increase to twice their normal size in a few minutes, being tense and painful, and a number of small œdematous patches appear all over the body. There are dangerous general symptoms: rigors, cold extremities, injected mucous membranes, quickened respiration and pulse, and after about half an hour the animal falls down and dies if not promptly relieved.

Milking causes the symptoms to disappear as quickly as they came. Bleeding is most beneficial, with a purgative and diuretics; low diet should be given, and if taken in time the patient recovers in twenty-four hours.

(*Journal de Médécine Vétérinaire et de Zootechnie.*)

THE CLINICAL VALUE OF THE EXAMINATION OF THE CELLULAR ELEMENTS OF THE URINE.

BY M. BERNARD, FACULTY OF MEDICINE, PARIS.

FOUR forms of cellular elements are found in the urine:—*A*, Cylinders; *B*, epithelial cells from the lining membrane of the urinary passages; *C*, blood or pus globules; *D*, various.

A. Cylinders—

(1.) Epithelial cylinders formed by collections of epithelial cells with the same morphological characteristics as those lining the uriniferous tubes and formed during their desquamation.

(2.) Mucous cylinders smaller in calibre than the above, pale in colour, transparent, and composed of mucus.

(3.) Granular cylinders of a larger calibre with clear marked outlines of a dark colour formed by disintegration of the epithelium lining the uriniferous tubes. They stain pink with eosine and red with carmine.

(4.) Colloid cylinders, irregular in outlines, of a yellow or brown colour, formed by the secretion of cells from inflamed Heidenhain's tubes.

(5.) Hematic cylinders, formed from consolidated and adherent red blood corpuscles.

(6.) Hyaline cylinders, pale and transparent in colour, larger than the mucoid cylinders, formed of coagulated albumen, will not stain with eosine.

The first two varieties are formed in the urinary tubes, and are found in the urine in desquamation catarrh of the kidney. The granular and colloid forms arise from the inflammation of the upper portion of the urinary tubes, and are found in cases of deep-seated inflammation (epithelial

nephritis) or destructive affections (tuberculous and cancer) of the kidney. The hematic indicate the renal origin of hematuria, and the hyaline albuminuria.

The presence of cylinders, however, is by no means always constant; any affection of the kidney may exist without their being formed.

B. Epithelial Cells—

(1.) Large squamous cells, translucent protaplasm, slightly granular nucleus, clearly defined, arise from the mucous membrane of the lower urinary passages.

(2.) Medium sized cells, irregular in shape, arise from the pelvis of the kidney, ureter, and bladder.

(3.) Small cylindrical or cylindroconical granular, well defined nucleus, arise from the uriniferous tubes, and generally meet with granular or cellular cylinders; they denote structural alteration of the kidney.

The epithelial cells contained in the urine afford from their appearance but little indication of their origin. They are altered in character when desquamated, and still more changed in the urine. The shape and condition of the desquamated cells give us an indication as to whether the epithelial lesions are deep seated or not, but are of no value in determining the seat of these lesions. It is impossible to say if these cells come from the bladder, ureter, or pelvis of the kidney.

If there is only a small proportion of red blood globules in the urine the matter is unimportant; if there is an appreciable number, but not sufficient to colour the urine red, Hallé has termed the condition "histologic hematuria."

A few leucocytes are present in normal urine, usually accompanied by some red blood corpuscles, but if there is a large quantity it indicates a pathological condition; and the same applies to pus.

(La Presse Médicale.)

USE OF ANTISTREPTOCOCCIC SERUM IN VETERINARY MEDICINE.

BY M. G. JOLY, VÉTÉRINAIRE EN PREMIER PROFESSOR, SCHOOL OF CAVALRY, SAMUR.

DURING the year 1902, 7·000 cc. of antistreptococcic serum has been used in the practice of the School of Cavalry.

M. Nocard, in the *Bulletin de la Société Centrale*, 30th June, made some remarks on the use of Marmoreck's serum in strangles, and it may be of some use if we relate our experience of it.

1. *Strangles Anasarca.*—Lignières is very emphatic on the value of antistreptococcic serum in such cases, and from our experience we agree with him, especially with young thoroughbreds. It is, however, of primary importance that the dose recommended by Marmoreck, viz., 30 cc. for the first four, and 20 cc. the following days, is not exceeded; we have had two fatal cases through doing so, one in 1897, the other in 1902. In the latter case the dose was very little in excess of Marmoreck's—40 cc. in the first for a colt two and a-half years old, morning and evening for two days.

2. *In Pleura-Pneumonia following Strangles.*—The serum has been used with good results in four cases.

3. *In nervous affections following Strangles.*—Good results were obtained in myelitis and in a case of meningic encephalitis.

4. *In Sore Throat and Catarrh.*—In many cases the usual discharge is promptly stopped, but if pus has formed in the glands the effects are *nil;* indeed, its formation appears to be increased. If there is no formation of pus the case may recover without any abscess forming.

5. *Pulmonary affections caused by Liguières Pastuerella.*—The serum appears to be considerably beneficial in these cases.

6. *Other Streptococcic affections.*—Cases in human medicine have been reported of septicæmia and puerperal fever being, if not cured, greatly benefited by its use. M. Bergeon has been successful in treating two cases of peritonitis following on castration in cryptorchids with it, but we had not the same good results with a traumatic case in a mare. We, however, have good reason to believe that in several cases its use warded off threatened attacks.

7. *Canine Distemper.*—Lignières has demonstrated that canine distemper is a pasteurellosis the same as equine infectious pneumonia; also that there is, in addition to the primary invasion, a secondary streptococcic one, and he has suggested the use of the serum, which, in the hands of some practitioners, has given good results. In conclusion, it would appear that antistreptococcic serum is of use

A. In anasarca, both from strangles and other causes.
B. In streptococcic affections of the mucous membranes, and in the earlier stages of broncho-pneumonia.
C. In the nervous sequelæ of strangles.
D. In infectious pneumonia with strangles, and from that due to pasteurellon.
E. Suppurating wounds.
F. Canine distemper.

It appears to be useless in preventing the formation of pus in the lymphatics from strangles, and harmful—

A. If too large a dose is given.
B. When pus has already formed in the glands in cases of strangles.

(*Revue Générale de Médecine Vétérinaire.*)

HYDROCHLORATE OF APOMORPHIA IN THE TREATMENT OF PICA (LICKING SICKNESS).

BY HERR RAUSCHER.

THE author's first experiments were made, as indicated by Reindl, on a herd of sixteen cattle in very bad condition, twelve of which had reacted to the tuberculine test, and the remaining four showing clinical symptoms of the disease. Twelve centigrammes were injected daily for four consecutive days in all, giving rise to considerable improvement in the general state of health.

The author has subsequently used apomorphine in animals (both cattle and horses) in bad condition with good results. In tuberculous cattle it has caused restoration of appetite and assisted in fattening, and he has

noticed the same in pica following gastro-intestinal catarrh, either acute or chronic, in both horses and cattle.

In pica induced by chronic diarrhœa in calves a cure was obtained by 2½ centigramme doses of apomorphine, subcutaneously, with tincture of opium per orum; the apomorphine appearing to act on the function of nutrition in the same manner as salt, phosphorus, and arsenic; and Reindl and Fesey's experiments on pigs prove that it increases the weight.

The dose of from 15 to 20 centigrammes apomorphine in some animals will cause considerable disturbance, and even symptoms of delirium. In the case of a horse an injection of 10 centigrammes, followed by 7 in half an hour, caused extreme agitation, the animal pawing the ground and perspiring freely. With thoroughbred horses the dose should not exceed 10 centigrammes. The injection in both horses and cattle can be made in the chest, but in some cases it gives rise to slight œdema.

(*Wochenschrift für Thierheilkunde.*)

VARIATION OF TEMPERATURE IN COWS IN ADVANCED PREGNANCY.

BY C. POST.

SAINT CYR and Chapelle have already shown that the temperature in cows will reach 40° Cent. five to six days before calving, and Hobday found that, in thirty cows tested with tuberculine a month before that, it varied from 38·9° to 39° Cent.; Leuz in three cows two to three weeks prior, 38·1° to 39·7° Cent.

Post has published some further observations. In six cows the temperature was taken morning and evening a few days before and after calving—two other non-pregnant animals being used for comparison. In these two the temperature varied from 38° to 39° Cent., whereas in the others it was as much as 1·5 Cent. A short time before parturition there was a noticeable drop.

(*Tijdschrift voor Veeartsenijkunde*, July 1903, p. 492.)

ARTHRITIS IN FOALS.

COMMUNICATED TO THE PARIS CENTRAL VETERINARY MEDICAL SOCIETY BY M. MOUSSA.

GENTLEMEN—I propose to make some observations that appear to me to be of some practical value on the condition that is known as "Arthritis in Foals."

Numerous observers have described this affection, and they all agree as regards the symptoms, but they widely differ as to the causes and proper treatment.

For the earlier theories as to the causes that were advanced, viz., change in feeding (Lecoq), deprivation of the calostrum (Darreau), insufficient food, cold, and feeding on too rich milk. Gradually, during the past twenty years, it has come to be regarded as infectious. The theory was first advanced by Bollinger, who showed the relationship between

umbilical phlebitis and secondary arthritis, and later on this had been confirmed by Morot, Chassaing, Lucet, and others. We now are inclined to attribute all cases of arthritis in new-born animals to infection, and to account for different forms of the disease by the different degrees of virulency in the infective material.

These theories have greatly changed the line of treatment advocated, so much so that preventive measures are about the only ones that are taken. No doubt, if umbilical infection, omphalthitis, phlebitis, and pervious urachus are looked upon as the primary causes of arthritis, antiseptic dressing of the umbilicus is naturally looked to as being of primary importance, and is the only treatment we find recommended in the text-books.

All cases of arthritis do not run the same course, there being the exudative and plastic forms, with intra-articular and intra-synovial coagulation, in others there is the formation of abscesses.

These latter cases are fatal, but the others, particularly the first, are amenable to treatment. Acting on the popularly accepted cause of the disease, hydrothropy, revulsives, and absorbents are had recourse to, often without success, which is not surprising, as in many cases the true cause is not recognised.

In many cases young subjects develop arthritis when every attention has been given to the umbilicus, and in which, on post-mortem examination, no lesion can be discovered in connection with the umbilicus, in the vein, artery, or urachus. In these it is usually those whose mothers are in good condition or even fat.

In a certain stud. in which from a hygienic point of view there was nothing to be desired, it had for some years been impossible to rear a foal. Despite every care on the part of the veterinary surgeon, all died in from three to six weeks from arthritis. In all the umbilicus was disinfected at birth, and carefully attended to for the first ten days; the mothers, however, had been well fed, and were fat.

Thinking that the feeding had something to do with the quality of the milk in 1899, the mares were put on a lower diet a couple of months before foaling, all oats being stopped, and getting only green food, bran, and hay, so that they were in fairly hard condition, but not fat. The result was that during the time this system remained in use there was no more arthritis in the foals.

In 1902 the former system of feeding was again introduced. The first foal born was a fine filly, "the mare foaling without difficulty," and the umbilicus was carefully attended to. The mare's oats were stopped as soon as the foal was born, but a week after birth she was attacked with arthritis.

The case was considered hopeless, but the mare was at once put on low diet, hay and bran, with 50 grammes of sulphate of soda daily. The result was most satisfactory. Forty-eight hours afterwards the case began to recover, and in ten days was completely cured without any other treatment. It may be said that this was only a coincidence, but it is confirmed by M. Moy, of Lannion, Brittany. A six weeks' old foal, whose mother was very fat, was attacked with diarrhœa and slight enteritis, which yielded in a few days to the usual treatment—cream of tartar, tincture of opium, and dry feeding for the mother. The umbilicus had become completely cicatrised, and there were never any appearances of omphalitis,

but ten days after the attack of enteritis he showed symptoms of arthritis in the left stifle. The mare was put on low diet, all oats stopped, and sulphate and bicarbonate of soda given daily. In eight days he was perfectly right again.

In my opinion, gentlemen, there are two forms of arthritis in newly born animals, one resulting from umbilical infection, the other dietetic causes, coupled probably with auto-intoxication, but which is much the less dangerous of the two.

These facts probably explain the opinions of MM. Darreau and Trasbut, according to whom there was at first indigestion followed by diarrhœa, and finally arthritis.

We are aware that this condition will cause pseudo-rheumatism of a toxic or toxic-infectious nature in adults, and that in the human being it comes on as a sequel to dysentry and certain other diseases, so that it does not seem unreasonable to assume the same cause to the accidents we so often see in young animals.

It is clear that in cases of arthritis of umbilical origin change in the feeding of the mare will have no effect on the foal, but I hope I have advanced sufficient proof to show that it will be if it arises from feeding, and for this reason alone, that the two classes of disease should be differentiated.

(*Bulletin de la Société Centrale de Médicine Vétérinaire.*)

COCAINE POISONING IN THE HORSE.

BY M. C. LESBRE.

An injection of 0.30 grammes of cocaine, in 10 grammes diluted water with a few drops of alcohol, was made on each side of the off fore fetlock of a horse for the purpose of diagnosing lameness of some standing. Shortly afterwards the patient became greatly excited, covered with perspiration, and the fetlock was much swollen. The next day this swelling had extended up to the forearm, with an affusion of sanguinous serum through the skin. The respiration was quickened, the beats of the heart violent and confused, and, although frequent efforts were made, but little urine was passed. Rheumatoid pains in all four limbs set in, and slings were used as the animal could not stand; but he was in great pain, struggling, excited, and bathed in perspiration. The pulse then became small and thready; although the heart-beats continued violent, the rheumatoid pains disappeared, and the hind quarters were slightly paralysed. The animal died on the fifth day.

Post-mortem.—The off fore limb on which the injection had been made was greatly tumefied, the hoof being separated from the coronary band, and there was acute laminitis. A thrombus had formed in the plantar veins, which were greatly enlarged and filled with a black organised clot that was slightly adherent. The plantar nerves were much congested.

There was well marked pericarditis, myocarditis, and endocarditis. There were general patches of ecchymosis on the peritoneum, and the connective tissue round the kidneys was hæmorrhagic and œdematous, the kidneys themselves being congested. The bladder was empty, but somewhat congested at the neck.

The cocaine used was proved to be pure, and the author can only account for the accident by individual idiosyncrasy.

(*Journal de Médecine Vétérinaire et de Zootechnie*, Dec. 1902.)

CASE OF PRIMARY SYNOVITIS PROBABLY OF INFECTIOUS ORIGIN.

COMMUNICATED BY M. L. BLANCHARD TO THE PARIS CENTRAL VETERINARY MEDICAL SOCIETY.

GENTLEMEN—The case I bring to your notice occurred in a grey pony seven years old, in good condition, that was destroyed on July 16th.

For eight days previous he had been lame on the off fore limb, and when I first saw him on the 13th there were marks of a blister on the shoulder. He only put his foot to the ground with difficulty, and movement caused intense pain. The fetlock was hot, and handling or moving it caused great pain. The diagnosis was acute synovitis. Hot packs with decoction of poppy heads were ordered, with salicylate and bicarbonate of soda.

The owner was warned that in all probability the other limbs would be attacked, and the next day he sent to say the pony was down with a broken leg.

On my arrival I found him in intense pain, down on his side, and covered with perspiration, all four fetlocks being hot and swollen, the off hind, on which he was lying, appearing to be broken. When raised up he was unable to stand, the fetlocks knuckling over and touching the ground. He was at once destroyed.

The lesions were identical in all four limbs. All the synovial membranes and sheaths of the tendons in connection with the fetlocks were intensely inflamed. The synovia was tinged with blood, which was extravasated round the fetlock and along the flexors in patches, but, curious to relate the feet were intact. The owner had had the pony for two years, during which time he had never been ill, and it seems that the case is one of those extremely rare ones of primary synovitis of infective origin.

(*Bulletin de la Société Centrale de Médecine Vétérinaire*, July 23rd, 1903.)

SPIRELLOSIS IN GEESE.

BY M. DUCLOUY, DEPUTY DIRECTOR PASTEUR INSTITUTE, TUNIS.

SPIRELLOSIS in the goose is a microbian disease caused by a spirellium (*Spirochæte anserina*) in the blood. It appears as a long undulating filament, very mobile, in the plasma, and is easily found.[1]

Up to the present the disease has only been recognised in the Caucasus, but it has lately been observed in birds reared in the neighbourhood of Tunis, almost at the same time that Dr. Safforgue at the military hospital

[1] Nocard and Leclainche. Les Maladies microbiennes des Animaux. 3rd edition. vol. i., page 250.

discovered the *Spirochæte obermeieri* in human beings suffering from malarial fever.

Young birds are the chief sufferers, and the evolution of the disease takes place in from eight to ten days on an average. There is complete loss of appetite and great emaciation, with profuse diarrhœa and weakness; the bird remains sitting down, and falls into a condition of coma. The temperature rises to 43° Cent. The disease is very fatal, especially with young subjects.

The lungs and respiratory apparatus are healthy; sometimes there is pericarditis. There is nephritis, enteritis, hypertrophy, and fatty degeneration of the kidney, and the spleen is enlarged and friable.

Diagnosis is easy on microscopic examination of a film of blood without any staining, the long filaments being easily seen amongst the red corpuscles either single or in a mass. They are extremely mobile, moving through the plasma, both with a rapid tortuous and undulating movement. They will take any of the usual stains on a cover glass preparation, but Ziehl's fuchsine diluted with water is the best.

The disease is communicable by inoculation from the goose to the duck, the organism being visible in about twenty hours and at the thirtieth are abundant, they also can be seen in the blood in the different tissues.

(*Recueil de Médecine Vétérinaire*, Sep. 1st, 1903.)

AMENDMENT TO ROYAL VETERINARY WARRANT.

THE following alteration has been made in the Royal Warrant, October 5th, 1903, relating to the pay and promotion of the officers in the Army Veterinary Department :—

"As it appears that the Royal Warrant of 5th October 1903 bears somewhat hard on Majors, Army Veterinary Department, who were promoted to that rank under the terms of the Royal Warrant of 20th March 1902, inasmuch as they have now, under the conditions of the above quoted Warrant, to serve five or ten years as a Major before becoming eligible for pay of 22s. or 24s. per diem to which they would have been entitled on completion of twenty or twenty-five years' total service, it has been decided to make provision for alteration of this anomaly by the insertion of the following article in the revise of the pay warrant.

"'An officer who held the rank of Veterinary Major on the 1st April 1902 may receive pay at 22s. or 24s. a day, after twenty or twenty-five years' total service respectively.'"

Royal College of Veterinary Surgeons.

RED LION SQUARE, W.C.,
December 1903.

FELLOWSHIP DEGREE.

A MEETING of the Board of Examiners for this degree was held on the 12th inst. Seven candidates entered for the examination, and the following is a list of those who passed and duly received the diploma :—Messrs.

J. S. Lloyd, Sheffield; Ernest Peacy, Stafford; G. Jones Roberts, Pwllheli; F. W. Emery, Belfast; E. C. Russell, Grantham; James Paton, Stevenage.

The Examiners were Professor James Macqueen, Mr. John Malcolm, and Mr. W. Hunting.

ARTHUR W. HILL, *Secretary.*

NEW VETERINARY COLLEGE, EDINBURGH.

AT the Christmas Examinations (1903) by the Royal College of Veterinary Surgeons, the following students passed the "First" Professional Examination:—

"A"—Messrs. T. G. Shand, Edinburgh; W. Simister, Blackpool; J. C. Storie, East Linton; W. P. Ruthven, Kinross.

The following passed the "Second" Professional:—

"B"—Messrs. H. R. Laycock, Halifax; W. Walker, Harrowgate; P. J. Walsh, Ballingarry; R. T. Wood, Edinburgh.

The following passed the "Third" Professional:—

"C"—Messrs. W. Darling, Worcester; C. Elphick, Newcastle-on-Tyne; A. J. O'Leary, Cork.

In class "C" (old rules), Mr. F. R. Shepherd, Swansea, passed and was admitted a member of the Royal College.

The following passed the "Fourth" Professional:—

"D"—Messrs. W. D. Lindsay, Edinburgh; J. C. Smith, Stokesley; R. M. Jones, Rhyl; and were admitted members of the Royal College.

Legal News.

NOT A M.R.C.V.S.—J. R. Linfoot (whose case was adjourned a fortnight ago for inquiries) was again charged with using the letters M.R.C.V.S. without being duly qualified. Mr. West prosecuted on behalf of the Veterinary College, and, after repeating evidence, said that a document which defendant had produced referred to the father, who was a veterinary surgeon at Holme-on-Spalding Moor, but who afterwards left, and died at Hull, his name being John Linfoot, and a certificate of death was handed in. Defendant said that his father's name was John Robert, the same as his own, and £6, 6s. was given by himself to his father to register defendant as a member of the College, and it was understood that the practice was to be defendant's as soon as he had completed some studies in Edinburgh. The Bench considered the case against the defendant proved, and said that it would be better to have admitted there was a mistake between the father and the son. Farmers must be protected from unqualified practitioners. Defendant would be fined £5 and costs, and solicitors' fees would be allowed, fourteen days being allowed for payment.

Reviews.

NOS CHIENS, RACES, DRESSAGE, ELEVAGE, HYGIENE, MALADIES. Par P. MÉGNIN. 1 vol. in-16 de 378 pages, avec 87 photogravures; cartonné. 4 francs.

This book is intended as a practical guide for the dog-owner, but contains much information that would be of great use to the professional man who specialises in canine practice. M. Mégnin gives some most interesting notes on the history and origin of different breeds of dogs, and a detailed description of the principal ones, elementary principles of breeding and rearing, and some remarks on breaking. The following is a list of the contents:—

Introduction.—Origin of the dog; natural history of the dog; classification of breeds.

Watch Dogs.—General remarks; breaking; shepherds' dogs; working.

Dogs used in War.—Dogs as draught animals.

Sporting Dogs.—French hounds; English hounds; Basset hounds; breaking, &c.; French shooting dogs; English shooting dogs; breaking and field trials; fox terriers; other breeds of terriers; terriers used for going to ground; fighting dogs; fox terrier coursing; ratters.

Pet Dogs.—Greyhounds and coursing; house dogs; poodles; trimming and shaving; the dog as an article of food; training, performing dogs; hygiene; kennels; breeding and rearing; diseases; diseases of youth; external injuries; wounds of sporting dogs and hounds; amputation of the ears and tail; internal diseases; dog shows; dog taxes; dogs and railways; ladies' dogs.

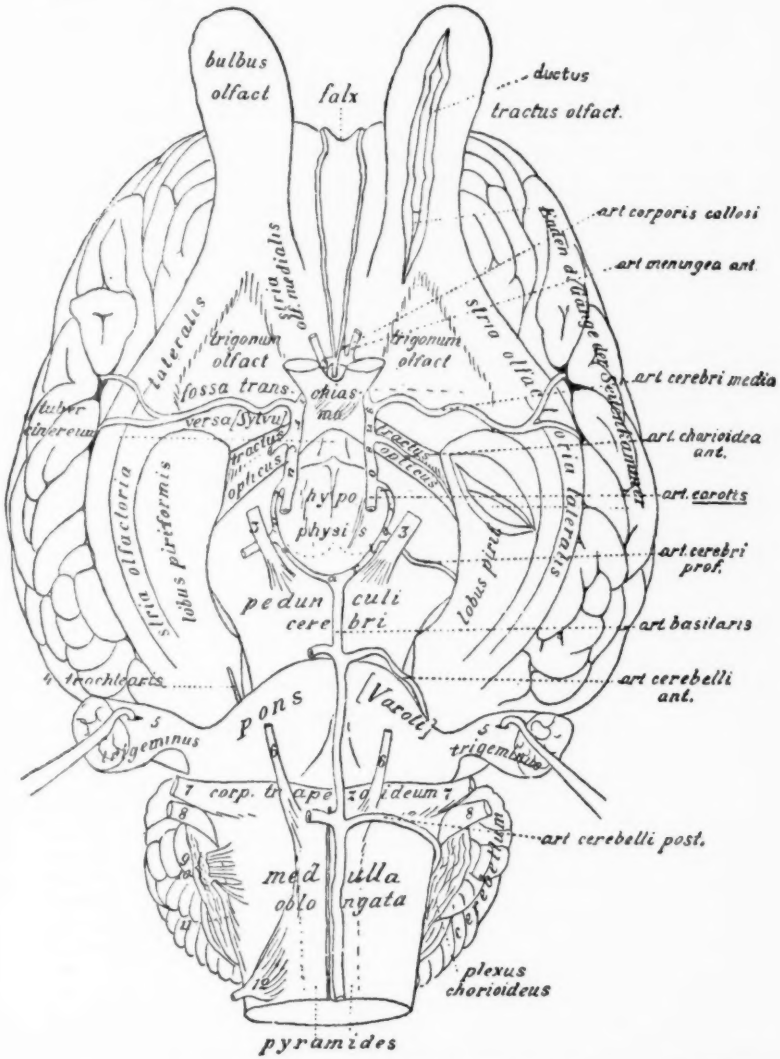
The book is profusely illustrated with photographs of different types of dog taken by the author at dog shows in France, Belgium, and England, and he has endeavoured to secure the best expressions possible.

PRAPARIRÜBUNGEN AM PFERD (ANATOMICAL PREPARATION EXERCISES IN THE HORSE.) By Prof. SCHMALTZ, of Berlin. Richard Schoetz, Berlin, 1903. 335 pages. Price, 10 Marks.

The above work, the third part of the eminent Professor's Exercises in Anatomical Preparation, maintains the high standard of the earlier two parts, and completes a book which should be in the hand of every veterinary student who has a mastery of the German language. Even to those not so fortunately situated, the clear and well-executed plates and cuts should prove of great assistance. Our volume deals with the pectoral cavity, abdominal cavity, urogenital apparatus, pelvic cavity, skull, eye, and throat organs. As an example of the author's method, we may take the pectoral region. First comes an account of the pectoral cavity, its form and limits, then a topographical description of the pectoral organs, followed by a demonstration and exenteration of these last, and concluding with the preparation of heart and lungs. The same plan is successfully pursued in the other departments above-mentioned.

A noticeable feature of the work consists in the six excellent plates (both in outline and shaded in) of the brain, in various stages of anatomical preparation. We reproduce for our readers a very beautiful and characteristic specimen of these in outline.

From its nature the book should be of especial use to those in charge of anatomical museums.



We regret that continued pressure on our space has prevented us from giving an earlier review of the work.

REPORT ON SOUTH AFRICAN HORSE SICKNESS. By H. WATKINS PITCHFORD, F.R.C.V.S.

We have received an introductory and three interim reports on the year's work done in Natal and Zululand in connection with this much debated subject. Mr Pitchford appears to have carried out the investigation in a methodical manner, and to carefully avoid making rash assertions, while at the same time he clearly points out what his impressions are.

At present he seems to have arrived at the fact that horses that are protected against the bites of *insects* escape the disease, while those exposed to them die. The method of protection appears to be immaterial, several having been tried, and the time-honoured theory of dew, wet grass, &c., have been exploded. The experiments have been carried out in the Beyamun Valley in Zululand, which, from personal knowledge, we are aware is a notoriously unhealthy locality. Mr Pitchford is unable to say what the insect that conveys the disease is, or in what manner it is conveyed, but he suspects the mosquito, especially anophales. He proposes to endeavour to breed this species during the non-horse-sickness season, and continue his experiments, which we will watch with great interest; or, if he is able to produce the disease at will through the agency of the mosquito at a healthy time of year, a most important point will have been cleared up.

FORMULAIRE DES VÉTÉRINAIRES PRACTICIENS. Comprenant environ 1500 formules et rédigé d'après les nouvelles méthodes thérapeutiques, par P. CAGNY, membre de la Société centrale de médecine vétérinaire. 5e édition, 1904. 1 vol. in -18, de 350 pages. Edition de poche sur papier indien ou édition de bureau sur papier ordinaire. Cartonné. 4 francs.

In bringing out the 5th edition of his *Formulæ for Veterinary Practitioners*, M. Cagny has endeavoured to achieve two objects :—

1. To give a therapeutical *résumé* based on modern medical theories.
2. To collect under one heading all the formulæ applicable to the disease of any particular organ, and a very complete therapeutical index enables the reader to find at a glance the remedy and the disease to which it is applicable.

The work consists of the following chapters :—

General therapeutics; pharmacology and posology; agents that modify external cause of disease; agents that cause modifications of the digestive apparatus; agents that modify nutrition; agents that modify the glands; agents that modify the circulation and circulatory system; agents that modify the respiratory system; agents that modify the nervous system; agents that modify vision; agents that act on the skin; agents that act on the lacteal secretion and mammary glands; agents that act on the urinary system; agents that act on the generative organs; agents without any special functional activity comprising electricity, hydropathy, exercise, and massage; caustics; astringents; emollients and adhesive bandages; antidotes; antivirulent agents; special therapeutics of slaughter cattle; special therapeutics of racehorses; special therapeutics of females; special therapeutics as regards operations; virus employed in the destruction of harmful animals; toxines used for the diagnosis of contagious diseases; diseases and their medical treatment.

Notes and News.

The new regulation requiring students at the German Veterinary Colleges to be in possession of the degree of Bachelor of Arts came into operation for the summer session that commenced on April 1.

There are 16 students at the Berlin College, 14 at Dresden, 6 at Stuttgart, and 7 at Hanover. These numbers are considered satisfactory.—(*Revue Générale de Médecine Vétérinaire.*)

VIENNA VETERINARY SCHOOL, 1901-1902.

During the year there were 107 students, viz., 50 civil, 50 military farriers (kurschmiede), 4 military pupils, and 1 doctor. 33 diplomas were granted, and one Austrian subject, who was in possession of a foreign qualification, presented himself for the final examination to enable him to practice.

During the year from 1st October 1901 to 30th September 1902, 7028 patients were treated—viz., 4708 horses, 64 cattle, and 1933 dogs.

In the surgical clinic, under Professor De Bayer, 1754 patients were treated—viz., 1302 horses, 417 dogs. 492 operations were performed on large and 194 on small animals.

In the medical clinic, under Professor De Schindelka, 5117 patients were treated—viz., 3395 horses, 47 cattle, and 1516 dogs.

In the obstetric clinic, under Professor De Polansky, 132 patients were treated—viz., 11 mares, 17 cows, and 92 bitches.

The ambulatory clinic, under Professor Reisinger, visited 101 patients—viz., 99 cattle and 2 goats.—(*Revue Général de Médecine Vétérinaire.*)

After 1st October 1903 the address of the French Central Veterinary Medical Society is at the Hotel des Sociétiés Savantes, No 18 Rue Serpente (Rue Danton), Paris.—(*Recueil de Médecine Vétérinaire.*)

A farmer at Fleurus (Belgium) has a sow, eight and a half years old, that has had 19 litters—the first of 8 and the second 9. The other 17 litters all consisted of over 10, the last 5 of 15.

Taking 12 pigs as an average, she has given $19 \times 12 = 228$, which at 12 francs the head = 2736 francs or £109 : 9 : 2.—*L'Echo Vétérinaire*, Liège, July 1903.

Army Veterinary Department.

Uniform—Blue. *Facings*—Maroon Velvet.
Agents for Payment of Officers of Army Veterinary Department at Home—
Messrs. HOLT & Co., 3 Whitehall Place, S.W.

Colonel (Ranking as Major-General).

Director-General—THOMSON, H., C.B., 15 Oct. 1892, War Office (22 Pall Mall, S.W.).

Colonels.

Glover, B. L., C.B. .	28 June 1897	Principal Veterinary Officer, 3rd Army Corps, Dublin.
Matthews, L., C.B. .	23 April 1898	Principal Veterinary Officer in India, Simla, India.

Lieut.-Colonels.

Smith, F., C.M.G.	15 Nov. 1899	Principal Veterinary Officer, Pretoria, S. Africa.
Nunn, J. A., C.I.E., D.S.O.	1 April 1900	War Office, Deputy Director-General.
Flintoff, T., D.S.O.	23 Feb. 1901	Bloemfontein, South Africa.
Pringle, R., D.S.O.	11 Dec. 1901	Inspecting Veterinary Officer, Punjab Command, Murree, India.
Moore, R.	3 May 1902	Inspecting Veterinary Officer, Bengal Command, Ninie Thal, India.
Rutherford, C., C.M.G.	17 May 1902	Principal Veterinary Officer, 1st Army Corps, Aldershot.
Lees, K.	1 June 1902	Inspecting Veterinary Officer, Madras Command, Ootacamund, Madras.
Forsdyke, F. W.	22 Aug. 1902	Principal Veterinary Officer, 2nd Army Corps, Salisbury.
Hazelton, E. H.	15 Oct. 1902	Inspecting Veterinary Officer, Bombay Command, Poonah, India.
Blenkinsop, L. J., D.S.O.	15 Mar. 1903	Curragh.

Majors.

Philips, J. J.	1 April 1893	South Africa. (On Leave, England.)
Duff-Gillespie, S.	26 Sept. 1894	Woolwich.
Savage, J. B.	30 Oct. 1898	Sialkote, Punjab, India.
Dibben, J. T.	15 Mar. 1899	Lucknow, India.
Day, E.	17 May 1899	Cahir.
Short, F. J.	24 Jan. 1900	Rawal Pindee, Punjab, India.
Raymond, R. W.	29 Nov. 1900	Cape Town, South Africa.
Moore, J.	29 Nov. 1900	Remount Department, War Office.
Appleton, A. F.	20 Mar. 1902	Dublin.
Nuthall, C. E.	do.	Madras.
Marriott, T.	do.	Hounslow.
Butler, E. R. C.	do.	Army Veterinary School, Aldershot.
Fowler, G. C. O.	do.	Aldershot.
Meredith, J. A.	do.	1st Life Guards, Windsor.
Sharp, F. W., D.S.O.	do.	Aldershot.
Taylor, E.	do.	Colchester.
Barry, D. J.	do.	Meerut, India.
Richardson, A. E.	do.	Potchefstroom, South Africa.
Walker, W. R.	do.	Instructor Army Veterinary School, Umballa, Punjab, India.
Lawson, E. J.	do.	Senior Veterinary Officer, Cairo, Egypt.
Drage, F. B.	18 July 1903	Royal Horse Guards, Regent's Park.
Lewis, T. E. W.	16 Nov. 1898	(Leave, England.)
Larnder, E. W.	28 Nov. 1898	Exeter.

Captains.

Coley, J. T.	26 Feb. 1896	Under orders for India.
Millar, W. M.	do.	11th Hussars, Curragh.
Wilson, A. C.	3 June 1896	Leave, medical certificate.
Anthony, W. S.	14 Oct. 1896	Leave, medical certificate.
Lennox-Cunyngham, H. M.	6 Jan. 1897	Somaliland.
Shore, F. H.	do.	14th Hussars, Aldershot.
Pallin, W. A.	do.	6th Dragoons, Curragh, Ireland.
Harris, P. J.	19 May 1897	Aldershot.
Wood, W. A.	7 July 1897	Somaliland.
Bolton, D.	29 Sept. 1897	On passage home.
Moore, R. C.	8 Dec. 1897	Mhow, Bombay, India.
M'Gowan, J. A. B.	22 Jan. 1898	Somaliland.
Bartlett, E. B.	2 Feb. 1898	Egypt.
Cochrane, R. C.	9 Mar. 1898	South Africa, civil employment with Orange River Colony Government.
Southey, J. B.	9 Mar. 1898	Special duty, Simla, India.
Todd, A. G.	2 April 1898	Bloemfontein.
Durrant, H. M.	6 July 1898	Umballa, Punjab, India.
Conder, G.	do.	Jhansi, Bengal, India.
Williams, A. J.	do.	Neemach, Central India.
Griffith, J. J.	24 Aug. 1898	South Africa.
Brown, E.	9 Nov. 1898	Army Remount Department, Rawal Pindee, India.
Houston, R. F. St. C.	do.	St. Thomas's Mount, Madras, India.
Newsom, A. C.	12 June 1899	England. (Leave, medical certificate.)
Eassie, F., D.S.O.	11 Sept. 1899	South Africa.

Stratton, F. C.	5 Mar. 1900	Muttra, Bengal, India.
Harris, C. B. M.	27 Aug. 1900	Senior Veterinary Officer, Somaliland Field Force.
Cranford, R. L.	22 Oct. 1900	Remount Department, Monah, Punjab, India.
Smith, W. D.	29 Nov. 1900	21st Lancers, Dublin.
Sawyer, H. T.	do.	Bangalore, Madras.
Williams, G. M.	do.	Ballincollig.
Wilson, F. W.	do.	17th Lancers, Edinburgh.
Peacocke, T. G.	7 Jan. 1901	Personal Assistant to Director-General, Remount Department, Simla, India.
Tatam, W. J.	18 Feb. 1901	On passage home.
Rose, C.	2 Sept. 1901	Kirkee, Bombay.
Axe, H. J.	3 Feb. 1902	Mhow, Bombay, India.
Martin, E. E.	do.	Army Veterinary School, Aldershot.
Knight, H. B.	17 Feb. 1902	Norwich.
Sullivan, H. A.	20 Mar. 1902	Army Veterinary School, Poonah, Bombay.
England, A.	do.	1st Dragoons, Shorncliffe.
Wright, W. N.	do.	13th Hussars, Aldershot.
M'Dougall, W.	do.	Newcastle-on-Tyne.
Lane, A. H.	do.	8th Hussars, Aldershot.
Barry, E. P. J.	do.	2nd Life Guards, Hyde Park.
Hunt, F. D.	5 July 1902	Remount Depôt, Ahmednagar, Bombay, India.
Clarke, A. E.	do.	Remount Depôt, Hoosur, Madras.
Shore, W. F.	do.	Remount Depôt, Sahorunpore, N.W.P., India.
Carr, F. U.	22 Aug. 1902	Veterinary Officer, Northern Nigeria Protectorate, West Africa.
Hunt, F. W.	20 Sept. 1902	Dublin.
Edwards, W. B.	12 Dec. 1902	Aldershot.
Rudd, T. W.	28 Feb. 1903	Remount Depôt, Babooghur, N.W.P., India.
Holmes, R. H.	25 Mar. 1903	Waterford.

Lieutenants.

Olver, A.	8 Mar. 1899	South Africa.
Quinlan, D. J.	18 Nov. 1899	Army Remount Department, Quetta, Baluchistan, India.
Aitken, J. J.	13 April 1901	Lucknow, India.
Deacon, A. F.	do.	India.
Dalgleish, A. J.	do.	Secunderabad, Madras, India.
Welch, H. C.	do.	Karachi, Bombay, India.
Fisher, O. S.	do.	Bangalore, Madras, India.
Gamble, H.	do.	Rawal Pindee, Punjab, India.
Lake, B. L.	do.	Secunderabad, Madras, India.
Head, A. S.	do.	Egyptian Army, Kartoom.
Knott, G. P.	do.	Kronstad, South Africa.
Hylton-Jolliffe, C. H.	5 June 1901	Meerut, India.
Jackson, G. T.	2 Nov. 1901	Curragh.
Lowe, W. C.	do.	India.
Swanston, A. N. M.	do.	Mian Meer, Punjab, India.
Russell, J. A.	do.	Secunderabad, Madras.
Steel, C. E.	do.	Mandalay, Burma. (Leave, medical certificate.)
Gillett, E. S.	do.	Bellary, Madras, India.
Beatty, P. V.	do.	Jhansi, Bengal, India.
Porteous, R.	do.	Veterinary Officer, Northern Nigeria Protectorate, West Africa.
Barnard, L.	do.	Cairo, Egypt.
Orton, E. C.	do.	India.
Roberts, N. d'E.	15 April 1902	Allahabad, N.W.P., India.
Glasse, M. St. G.	do.	Somaliland.
Nicol, W. H.	do.	Barrackpore, Bengal, India.
Probyn, F. S.	do.	Mooi River, Natal, South Africa.
Mosley, H. S.	do.	Mhow, Bombay, India.
Fail, F.	16 May 1903	India.
Moore, F. A. S.	do.	Kroonstad, South Africa.
Ludgate, W.	do.	India.
Plunkett, R. A.	do.	Ladysmith, Natal, South Africa.
Jelbart, W. A.	do.	India.
Nicholas, J.	do.	Bloemfontein, Orange River Colony, S. Africa.
Pallin, S. F. G.	do.	India.
Tapley, J. J. B.	do.	Bloemfontein, Orange River Colony, S. Africa.
Allen, H.	do.	India.
Oliver, E. S.	do.	Middleburg, South Africa.
Greenfield, H.	do.	India.
Schofield, W. L.	do.	Standerton, South Africa.

Webb, E. C.	.	16 May 1903	India.
Wadley, E. J.	.	do.	Cape Town, South Africa.
Stevenson, J. R.	.	do.	India.
Neale, W. W. R.	.	do.	Harrismith, South Africa.
Leaning, A.	.	do.	Somaliland.
Gibbs, H. E.	.	do.	India.
Matthews, R. C.	.	do.	Aldershot.
Ryan, H. T.	.	22 July 1903	Aldershot.

Attached.

Fenton, Qr.-Mr. in Army R.C., Hon. Lieut., 29 July 1903, Scope Depôt, Woolwich.

On Temporary Half-Pay.

Major.

Cooper, J., 11 Sept. 1900, South Africa.

Retired Veterinary Officers of the Regular Army who are Employed.

Berne, Vet.-Lieut.-Col. J. C. . Portsmouth.	Case, Vet.-Major M. F. M., Royal Horse Infirmary, Woolwich.
Clayton, Vet.-Lieut.-Col. C. . Brighton.	Crow, Vet.-Major W. A. . . Aldershot.
Dwyer, Vet.-Col. J. C. . . Woolwich.	Grainger, Vet.-Major J. K. . York.
Reilly, Vet.-Lieut.-Col. J., Remount Department, P.V.O. Dublin.	Killick, Vet.-Lieut.-Col. T. A. . Shorncliffe.
Walters, Vet.-Col. W.B., C.B., 4th Army Corps Woolwich.	Pallin, Vet.-Major D. C. . . Chatham.
	Rowe, Vet.-Lieut.-Col. R. . London.
	Woods, Vet.-Major J. A. . . Canterbury.

Half-Pay.

Griffith, Lieut.-Colonel J. R., D.S.O., Egyptian Army, Kartoom.

ARMY VETERINARY DEPARTMENT.

(Extract from *London Gazette.*)

WAR OFFICE, PALL MALL, *December* 1.

IMPERIAL YEOMANRY (North Somerset). — Veterinary-Lieutenant F. W. Leigh to be Veterinary-Captain.

December 8.

The undermentioned Lieutenant-Colonels to be Colonels. Dated 5th October 1903:—Benjamin Lucan Glover, F.R.C.V.S., C.B.; Iles Matthews, F.R.C.V.S., C.B.

Communications, Books, Journals, &c., Received.

Agricultural Journal (Cape of Good Hope); Berliner Thierärztliche Wochenschrift; La Clinica Veterinaria (Milan); Deutsche Thierärztliche Wochenschrift; Tannoform in Veterinary Medicine (March); The Sanitary Journal; Scottish Medical and Surgical Journal; Veterinary Record; La Riforma Veterinaria; Le Mois Scientifique (Paris); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Johns Hopkins Hospital Reports; Journal of Comparative Medicine and Veterinary Archives; Recueil de Médecine Vétérinaire; Gazette Médicale de Paris; Modern Medicine; Johns Hopkins Hospital Bulletin; Il Veterinario di Campagna (Moncalieri); Le Bulletin Vétérinaire (Orleans); Revista de Medicina Veterinaria (Bucarist); La Revista Veterinaria (Buenos Aires); Zeitschrift für Fleisch und Milchhygiene (Berlin); Buletinul Societatii de Sciinte diu Bucuresci-Romania; The Meat Trades Journal; The Dental Record.